100 AREA / 300 AREA UNIT MANAGERS' MEETING MINUTES

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

TRANSMITTAL/APPROVAL

APPROVAL: _______________ Date 6/8/06

Kevin D. Bazzell, RL (A3-04)
River Corridor Project Manager

APPROVAL: _______________ Date 06/08/06

Briant Charbonneau, RL (A6-33)
Groundwater Project Manager

APPROVAL: John B. Price / Rick Bond Date 6/08/2006

John Price / Rick Bond, Ecology (H0-57)
Environmental Restoration Manager

APPROVAL: Larry Gadbois Date July 13, 2006

Larry Gadbois, EPA (B1-46)
100 Aggregate Area Unit Manager

APPROVAL: Alicia Boyd Date 06-08-06

Alica Boyd, EPA (B1-46)
300 Aggregate Area Unit Manager

The attached 12/8/05 UMM Meeting Minutes are comprised of the following:

Attachment 1	-	December Agenda and Open Action Items
Attachment 2	-	Attendance Sheet
Attachment 3	-	Meeting Minutes and New Action Items
Attachment 4	-	Ron Jackson- Groundwater Operable Unit Status
Attachment 5	-	Bob Peterson-100/300 Area Groundwater, River Corridor Shoreline Monitoring Status
Attachment 6	-	Steve Clark- RESRAD Software Update
Attachment 7	-	Jack Donnelly and John Price Email "Contaminated Batteries"
Attachment 8	-	Kelly Cook and Lorna Dittmer Email on 100D Burial Grounds and Remaining Sites
Attachment 9	-	Dean Strom - Burial Grounds, Remaining Sites and RPAS Status Listing and Color Maps of B/C Area
Attachment 10	-	Mike Thompson 100-C-7 Borehole Meeting Minutes
Attachment 11	-	Dean Strom - Backfill Concurrence Checklist No 1607-B2:1 for Waste Site1607-B2:1 Septic Drain Field and Backfill Concurrence Checklist Distribution Sheet for Waste Site 126-B-3
Attachment 12	-	Mike Mihalic -Field Remediation Closure Spent Nuclear Fuel (SNF) and Anomalies for 118-B-1 and 118-C-1 Burial Grounds
Attachment 13	-	100K,100F, 1U2/6 100D Status Notes
Attachment 14	-	Jonathan Francher- Email to Jack Donnelly on 100N Input Field Remediation
Attachment 15	-	Rudy Guercia- 300 Area D & D Status as of 12/8/05
Attachment 16	-	Memo on 300 Area Field Remediation Status
Attachment 17	-	Jack Donnelly Email on Use of 618-3 AOC for 618-2 Waste
Attachment 18	-	Jack Donnelly - Map of Combined Trench Waste Sorting Area for the 118-F-1,118-F-2 and 118-F-6 Waste Sites
Attachment 19	-	DOE Radioactive Air Emissions from the Hanford Site

Prepared by: Sharon Black Date 6/8/06

Sharon Black (H0-19)

Admin, WCH Regulatory Integration and Outreach

Concurrence by: ______________________ Date ____________

Dru Butler (H0-19)

Director, WCH Regulatory Integration and Outreach

128832

100 AREA / 300 AREA UNIT MANAGERS' MEETING MINUTES

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

DISTRIBUTION

DOE-RL

Kevin Bazzell	A3-04
Briant Charboneau	A6-33
Clifford Clark	A3-04
Rudolph Guercia	A3-04
Roger Pressentin	A3-04
John Sands	A3-04
Douglas (Chris) Smith	A6-38
K (Mike) Thompson	A6-38
Arlene Tortoso	A6-38
Kent Westover	A3-04
Jamie Zeisloft	A3-04

ECOLOGY

Jeff Ayres	H0-57
Rick Bond	H0-57
Dib Goswami	H0-57
Alisa Huckaby	H0-57
John Price	H0-57
Beth Rochette	H0-57
Noel Smith-Jackson	H0-57
Jean Vanni	H0-57

EPA

Alica Boyd	B1-46
Dennis Faulk	B1-46
Larry Gadbois	B1-46

FH

Jane Borghese	E6-35
Ronald Jackson	E6-35
Robert Piippo	H8-12
John Winterhalder	E6-35

PNNL

John Fruchter	K6-96
Mary Hartman	K6-96
Ron Jackson	E6-35
Stuart Luttrell	K6-96
Thomas Naymik	K6-96
Robert Peterson	K6-75

WCH

Kimberley Anselm	H9-02
Tina Blakley	X0-17
Mark A. Buckmaster	X9-07
Dru Butler	H0-19
Stacy Callison	X9-07
Richard Carlson	X0-17
Steven Clark	H9-01
Kelly Cook	X0-17
Franklin Corpuz	L6-06
John Darby	L6-06
Steven Dieterle	L1-04
Lorna Dittmer	H9-02
Jack Donnelly	X0-17
Jonathan Fancher	X5-57
Ken Gano	H9-03
Jim Golden	L1-04
Charles Hedel	H0-23
Larry Hulstrom	H0-23
Kim Koegler	L1-07
Roger Landon	H9-03
Deena La Rue	H0-20
Jeffrey Lerch	H0-23
John Ludowise	X0-17
Larry Miller (Rex)	X3-40
Jennifer Ollero	H0-19
Roger Ovink	H9-01
Scott Parnell	X5-57
Mike Schwab	H0-23
Annie Smet	X0-17
Bradley Smith	L1-01
Dean Strom	X3-40
Jill Thomson	H0-23
Steve Weiss	H0-23
Donna Yasek	L1-07

ADMIN RECORD

Debbie Isom - (2 copies)	H6-08

Please forward distribution list changes to *Sharon Black* WCH (H0-19)

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 1

December Agenda and Open Action Items

Attachment 1

100 Area / 300 Area Unit Manager Meeting Agenda

Field Remediation, Groundwater, D4

December 8, 2005

WSU, Consolidated Information Center, Room 214, Richland, WA 99352

12:30 to 1:30 **100 Area Groundwater**

- Open Action Items
- 100-KR-4
- 100-NR-2
- 100-HR-3
- Action Items

1:30 to 1:45 **300 Area Groundwater**

- Open Action Items
- *Project Specific Items*
- Action Items

1:45 to 2:15 **100 Area Field Remediation**

- Open Action Items
  - *Change of RESRAD software to version 6.30 will require change to the 100 Area to RDR/RAWP and validating revisions (Steve Clark)*
- 100 Area Common-*list specific items*
  - 100 Area Explanation of Significant Difference(ESD)
  - Contaminated Batteries treatment-agreement
  - Engineering Design and Closure *(Kelly Cook and Lorna Dittmer*
- 100-B/C *(Jack Donnelly)*
  - General Status
  - 116-C-3 Treatment approach
  - Anomalous waste update
- 100-K and 118-K-1 *(Jack Donnelly)*
  - General Status
- 100-N *(Jack Donnelly)*
  - General Status
- 100-D *(Jack Donnelly)*
  - General Status
  - Air Monitoring Plan
- 100-F/100-IU-2/6 *(Jack Donnelly)*
  - Combined sorting trench-agreement

2:15 to 2:30 **End States and Final Closure Project** (*Ella Feist, Jill Thomson)*

- Open Action Items
- 100 B/C Pilot Risk Assessment
- 100/300 Area Risk Assessment
- Columbia River Component
- D Area Orphan Sites
- Integrated Work Plan

2:30 to 2:45 **100 Area D4**

- Open Action Items
- Status

2:45 to 3:30 **300 Area Source and D4**

- Open Action Items
  - *Jack Donnelly, Washington Closure Hanford (WCH), and Alicia Boyd, Environmental Protection Agency (EPA), to check regulatory basis for co-mingling of waste, verification sampling, and Land Disposal Restriction (LDR) issues in regards to the 618-2 to 618-3 site remediation.*
- FR
  - General status
  - Use of 618-3 for sorting 618-2-agreement
  - X ray fluorescence(XRF) usage
- D4
- Action Items

3:30 to 4:00 **Special Topics** (*if necessary*)

- Status of Tri-Party agreement (TPA) milestone M-94-01 (*Rick Bond)*
- Air Emission Dose Methodology (may start at 3:00 if ahead of schedule) (*Jack Donnelly*)
- MP-14 update – regulatory approval status (*John Sands*)

NEXT MEETING: January 12, 2005 WCH, Hanford Square IV, Room 454, A & B

To all UMM Members: ***Have A Merry Christmas and See You Next Year!***

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 2

Attendance Sheet

Attachment 2

100 AREA/ 300 AREA UNIT MANAGER MEETING

Field Remediation, Groundwater and D4

OFFICIAL ATTENDANCE RECORD

December 8, 2005

NAME	ORG	O.U. ROLE	TELEPHONE	SIGNATURE
Anselm, Kimberly A.	WCH	100	372-9363	
Ayres, Jeff	ECY	100 / 300 Tech support	372-7881	[illegible]
Bazzell, Kevin D.	DOE-RL	100	373-0463	
Bond, Rick	ECY/DOE	300	372-7885	FW Bond
Borghese, Jane V	FH ~~DOE-RL~~	100 / 300	373-3804	JV Borghese
Boyd, Alicia	EPA	300	376-4919	Alicia L. Boyd
Buckmaster, Mark	WCH	100 Field Remediation Closure	521-2089	
Butler, Dru	WCH	100 /300 Regulatory Integration (RIO)	372-9956	
Callison, Stacy W.	WCH	100 / 300	521-6515	
Carlson, Richard A.	WCH	100 / 300	373-1440	
Charboneau, Briant	DOE-RL	100 / 300	373-6137	
Clark, Clifford E (Cliff)	DOE-RL	300 Regulatory Support	376-9333	
Clark, Steven W.	WCH	100 / 300	372-9531	
Cook, Kelly E.	WCH	100 / 300	373-5275	
Corpus, Franklin M.	WCH	300		
Darby ,John W.	WCH	300 Area Task Lead	373-3008	
Dieterle, Steven WCH	~~DOE-RL~~	300	372-9503	
Dittmer, Lorna M.	WCH	100 /300	372-9664	
Donnelly, Jack W.	WCH	100 /300	373-9299	[illegible]
Fancher, Jonathan (Jon)	WCH	100	373-9556	
Faulk,Dennis	EPA	100	376-8631	[illegible]
Fruchter, Jonathan S.	PNNL	100 / 300	376-3937	J Fruchter
Gadbois, Larry	EPA	100	376-9884	Larry Gadbois
Gano, Kenneth	WCH	100	372-9295	
Golden, James W.	WCH	100 / 300 [illegible]	521-0877	[illegible]
Guercia, Rudolph (Rudy)	DOE-RL	300 D & D	376-5494	[illegible]
Hartman, Mary	PNNL	100 Groundwater	373-0028	Mary J Hartman
Hedel, Charles W.	WCH	100 / 300	372-2699	
Huckaby, Alisa D.	ECY	100 Ecology	372-7909	A.D. Huckaby
Hulstrom, Larry	WCH	300	372-9291	
Jackson, Ronald L. FH	~~DOE-RL~~	100 Groundwater	373-3599	Ronald L Jackson
Koegler, Kim J.	WCH	300	373-4736	
Landon, Roger J.	WCH	100 / 300	372-9209	Roger J. Landon
La Rue, Deena N.	WCH	100 / 300 Report change control	375-9431	
Lerch, Jeffrey A.	WCH	100 / 300 ESFC	372-9206	
Ludowise, John D.	WCH	100 / 300	373-1045	
Lutrell. Stuart P.	PNNL	100 Groundwater	376-6023	[illegible]
Miller, Larry R. (Rex)	WCH	100	373-5876	
Naymik, Thomas G	PNNL	300 Groundwater	376-0916	
Ollero, Jennifer F	WCH	100 / 300 Regulatory Integration (RIO)	372-9620	
Ovink, Roger W.	WCH	100 / 300 S & D M	375-9426	
Parnell, Scott E.	WCH	300 Field Remediation	373-9975	
Petersen, Scott W.	~~DOE-RL~~	100	372-9126	
Peterson, Robert E.	PNNL	100 / 300 Groundwater	373-9020	RE Peterson
Piippo, Robert E.	~~DOE-RL~~ FH	300		

100 AREA/ 300 AREA UNIT MANAGER MEETING

Field Remediation, Groundwater and D4

OFFICIAL ATTENDANCE RECORD

December 8, 2005

Pressentin, Roger A.	DOE-RL	300		
Price, John P.	ECY/DOE	100 / 300	372-7921	
Rochette, Beth	ECY	300 Tech support		
Sands, John P.	DOE-RL	100	372-2282	
Schwab. Michael R.	WCH	100	372-9407	
Smet, Ann K. (Annie)	WCH	100 / 300	373-9683	
Smith, Bradley A.	WCH	300 324 / 327 D4		
Smith, Douglas C (Chris)	DOE-RL	100 / 300	372-1544	
Smith-Jackson, Noel	ECY	100 / 300	372-7926	
Strom, Dean	WCH	100 - BC	373-5519	
Thompson, K M (Mike)	DOE-RL	100 / 300	373-0750	
Thomson, Jill E.	WCH	100 / 300	372-9200	
Tortoso, Arlene C.	DOE-RL	100	373-9631	
Vanni, Jeanne	ECY	100 Lead Regulatory Permits	372-7930	
Weiss, Stephen G.	WCH	100 / 300 Lead Tech Risk Assessment	372-9495	
Westover, Kent	DOE-RL	100	376-3967	
Winterhalder, John A.	~~DOE-RL~~	100	372-8144	
Yasek, Donna M.	WCH	100 / 300 D & D	372-9978	
Zeisloft, Jamie	DOE-RL	100	372-0188	
~~GOSWAMI, DIB El.~~				
Goswami DIB	Eco(89)	100 GW	372-7902	
Fabré Russel	FH/GRP	100-NR-2	373-2774	
Shea, Jacqui	Ecology	100 GW	372-	
WOOLARD, JOAN	WCH		372-9649	
Phoads, Kathy	PNNL		375-6832	
Jarvis, Mary	DOE-RL	Dose Assessment Present.	376-2256	
Hendrickson, Doris	ECY	Air Lead	372-7983	
MARTELL, P. JOHN	DOH		946-3798	
Priddy, Mike	DOH	Envm Lead	946-0564	
Cameron, Craig	EPA	200 Area (interest in air)	376-8665	
Schmidt, John	DOH		946-0876	

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 3

Meeting Minutes and New Action Items

100 AREA / 300 AREA UNIT MANAGERS' MEETING MINUTES

Groundwater / Remedial Action Unit / Source Operable Units

DECEMBER 8, 2005

ADMINISTRATIVE

- ***Next 100/300 Area Unit Manager Meeting (UMM)***

  The next combined 100/300 UMM will be held on January 12, 2006, at Washington Closure Hanford (WCH), 3070 George Washington Way, Hanford Square IV, Room 454 A&B, from 12:30 p.m. to 4:00 p.m.

100 AREA GROUNDWATER

- ***Open action Items*** None

- ***100-KR-4*** -- Status in provided in ***Attachment 4***.

  Ron Jackson, Fluor Hanford (FH), provided a status on the KW Groundwater Remediation. FH plans to start addressing the chromium plume in KW Reactor Area in January 2006.

  On December 2nd, the D Transfer Buildings went down and froze. FH will need to wait for warmer weather to run tests in order to determine what caused the event

- ***100-NR-2*** -- Status in provided in ***Attachment 4***.

  Dennis Faulk of the U.S. Environmental Protection Agency (EPA) inquired if any ecological issues were identified during sampling. Ron Jackson (FH) identified three ecological issues:

  1) Abnormalities in the soft tissue of clams
  2) Presence of lead in the tissue of mice
  3) Low oxygen levels

  Dennis Faulk (EPA) made a recommendation that the Treatability Test Plan be sent to the regulators for a 30 day formal public review period due to public interest.

  Dennis Faulk (EPA) questioned what was EPA's role with the termination of a pump and treat facility and speculated that there was a need to concur on the record as to the decision.

  Dennis Faulk (EPA) discussed formulating a concurrence letter --See ***New Action Items***.

Jean Vanni (Ecology) mentioned that they should investigate the permits for the pump and treat. They should review permits before a public Record of Decision (ROD) is incorporated into the Hanford Facility RCRA Permit. .--See *New Action Items*.

Russel Fabre (FH) provided status on Ecological Impact Assessment. Draft Assessment findings were delivered to Ecology on October 31, meeting the milestone obligation.

- ***100-HR-3*** -- Status in provided in ***Attachment 4***.

  John Price (Ecology) noted that the 183-H permit language needs clarification -- See ***New Action Items***.

300 AREA GROUNDWATER

- ***Open action Items*** -- Status provided in ***Attachment 5***.
- ***Project specific items***

  Dennis Faulk (EPA) asked for groundwater status on the M-24 Well Plan. FH is ahead in number drilling packages.

FIELD REMEDIATION

- ***100 Area***
  - ***Open Action Items***

    None

  - ***Residual Radioacativity (RESRAD) Software Update*** -- Status provided in ***Attachment 6***.

    Steve Clark (WCH) stated that at its next revision, the 100 Area Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) will be updated to include the latest version of the RESRAD software. Dennis Faulk (EPA) suggested that more sophisticated computer models than RESRAD should be used for sensitive evaluations of groundwater and river protection because the RESRAD code is conservative and may indicate groundwater and river protection problems where there are none. Use of computer codes provided by the U.S. Geological Survey (USGS) or the STOMP code from PNNL were suggested. Data for input parameters should be available from hexavalent chromium leach tests done in the B/C area.

    A meeting will be held to follow up on a November15, 2005 River Corridor Brown Bag action item to conduct a pilot demonstration of RESRAD-Soil, RESRAD-Chem, and STOMP computer models for evaluation of protection of groundwater from soil contamination. John Price (Ecology) will contact the members of the evaluation team.

- ***100-K***

  Dennis Faulk (EPA) to pursue outside determination on K Basins compliance --See ***New Action Items***.

- ***100 Area Common***

  - ***100 Area Explanation of Significant Difference (ESD)***

    Chris Smith (DOE) stated the ESD for the 100 Area Remaining Sites and 100-NR-1/100-NR-2 RODs was placed on hold and suspended as there was no impact to the current remediation efforts. Jack Donnelly (WCH) stated the current ESD was revised to incorporate the second round of comments from EPA Region 10, and all figures and technical edits performed. John Price (Ecology) stated the Attorney General review is still progressing. It was noted that without having the ESD approved, the plug-in and confirmatory sampling approaches may have to be eliminated from the 100-N Area RDR/RAWP which is scheduled for submittal to Ecology in CY07.

  - ***Contaminated Batteries Treatment Agreement***

    Jack Donnelly (WCH) submitted for the minutes, the EPA and Ecology approval -- see ***Attachment 7*** to allow macroencapsulation of mercury, silver, and cadmium batteries as adopted by EPA and Ecology. Dennis Faulk (EPA) asked if the next revision of the 100 Area RDR/RAWP would reflect this agreement, and it was agreed to incorporate it into the next revision.

  - ***Engineering Design and Closure*** -- Status provided in ***Attachment 8***.

    The Ecology request for a supplemental design for 100-D-30 and 100-D-56 to look for sodium dichromate was completed and is being added to the design package prior to being issued.

  - ***Treatment Plan for 116-C-3***

    Jack Donnelly stated the treatment plan for 116-C-3 required additional information and was being worked with EPA. Dennis Faulk (EPA) asked for two additional items.

    - What is the resulting transuranic concentration if the sludge was viewed as a separate stream after solidifying the sludge to meet the WIPP waste acceptance criteria?
    - What is the cost to separate the sludge as a separate stream, reduce the volume, treat, and send to WIPP?

    Dennis did indicate that treating the liquid and sludge as it is in the tank currently as one waste stream needs to be further explained in the treatment plan.

- ***100B/C***

- *Burial Grounds*

  Dean Strom (WCH) submitted a map and a status to the minutes -- See *Attachment 9*.

- *Remaining Sites*

  Dean Strom (WCH) submitted a backfill concurrence checklists to the minutes --see *Attachment 11* for 1607-B2:1 and 126-B-3.

  1607-B2: The 100-BC Project has DOE and EPA concurrence to leave the 1607-B2 pipeline in place, as is, and not remove/remediate to within 25 feet of B Reactor. WCH will cap the end with grout. DOE and EPA agreed that chasing the pipeline under B Reactor parking lot was not required. Especially, if the B Reactor Museum wanted to use the existing sanitation/sewer line in the future and construct a drainfield.

- *RPAS*

  100-C-7 Issue- Mike Thompson (DOE) stated this is presently in design. Dean Strom (WCH) submitted a copy of notes from a meeting held with DOE and EPA concerning 100-C-7 -- See *Attachment 10*. The purpose of the meeting was to discuss remedy options and preliminary costs.

- ***Anomalous Waste Update*** -- Status provided in *Attachment 12*.

  Mike Mihalic (WCH) provided a presentation on anomalous waste at 100-B/C. A draft schedule of events was also provided, with removal of waste tentatively planned for July 2006. Jack Donnelly (WCH) indicated the 2-year time limit for waste staging piles was nearing the March 2006 deadline and that an extension would be requested as required. EPA did not indicate an issue with the extension.

- ***100-K and 118-K-1*** -- Status provided in *Attachment 13*.

  Jack Donnelly (WCH) stated the 100-K Group 4 air monitors required for the remedial action on Group 4 waste sites were no longer needed as backfill has commenced and that the monitors would be turned off within the next several weeks. Larry Gadbois (EPA) concurred with the action.

- ***100N***

Jack Donnelly (WCH) stated remediation at 116-N-1 was completed and verification samples collected. Verification sample splits were also collected by Ecology. Noel Smith-Jackson (Ecology) indicated their data was expected within the next several weeks.

Jack Donnelly further stated the subcontractor is demobilized. Data is expected back around 12/14/05. The backfill request for proposal (RFP) was issued and backfill is expected to begin in April 2006. Backfill is scheduled for completion in September 2006, with revegetation conducted between November 2006 to January 2007 -- *See* ***Attachment 14***.

- ***100-D*** -- Status provided in ***Attachment 13.***

  - ***100 Air Monitoring Plan***

    Jack Donnelly (WCH) requested the status of Ecology's approval of the 100-D Air Monitoring Plan. John Price (Ecology) indicated he was ready to approve but has not received it in the mail. Jack will to follow up.

- ***100F/100-IU-2/6*** -- Status provided in ***Attachment 13.***

  - ***Combined Sorting Trench Agreement***

    Jack Donnelly (WCH) entered into the minutes the map to use a combined trench waste sorting area for the 118-F-1, 118-F-2 and 118-F-6 waste sites. Larry Gadbois (EPA) approved the use of the combined trench as outlined on the map --See ***Attachment 18.***

END STATES AND FINAL CLOSURE PROJECT

- ***Open Action Items***

  Jill Thomson (WCH) stated there are no action items at this time.

- ***100B/C Pilot risk Assessment***

- ***100/300 Area Risk Assessment***

  Dennis Faulk (EPA) questioned and affirmed that the 100/300 Area Trustees gave an "OK" to path forward for the 100/300 Area Risk Assessment.

  John Price (Ecology) questioned if WCH had included Columbia River Soil sampling and the 100-N Area in baseline. Jack Donnelly (WCH) stated that WCH has a placeholder for the evaluation.

- ***Columbia River Component***

  Data compilation summary report is in progress and will be available after the first of February

  Continuing to evaluate data for the purpose of bounding the risk assessment scope for the Columbia River Component. Draft data evaluation and scoping report is scheduled to be submitted to RL in April.

- ***D Area Orphan Sites***

  Historical review phase of work will be done by early Spring and will transition to the field walk down, which will continue into late Spring. This work scope has been accelerated based on input from the Tri-Parties and is included in the Integrated Project Baseline.

- ***Integrated Work Plan***

DOE and the Regulators are participating in scoping efforts for the Integrated Work Plan, which will be used to define a strategy to obtain a final Record of Decision (ROD) for cleanup actions in the River Corridor. The strategy document is anticipated to be completed in September 2006. Dennis Faulk (EPA) stated the timing is appropriate, as the 5 Year ROD Review will identify elements that are needed to get to final RODs. The 5 Year Review should be ready for review by February 2006, building in action items that may be appropriate to reflect in the Integrated Work Plan.

100 AREA D4

- ***Open Action Items***

  Rudy Guercia (DOE) reported there are no open actions at this time

- ***General Status***

300 AREA SOURCE AND D4

- ***Open Action Items***

  Item was closed by Jack Donnelly (WCH) and Alicia Boyd (EPA)

- ***Field Remediation*** -- Status provided in ***Attachment 16.***

  - ***Use of 618-3 for sorting 618-2 Agreement***

    Jack Donnelly (WCH) submitted an email from Alicia Boyd (EPA) giving approval for using the 618-3 waste site as a sorting/segregation area for waste from the 618-2 burial grounds -- Status provided in ***Attachment 17.***

  - ***Field Remediation X Ray Fluorescence (XRF) Usage***

    Jack Donnelly (WCH) took the action to set up a meeting to further discuss the use of XRF screening versus sampling every 150 cubic yards to verify waste profiles -- See ***New Action Items.***

- ***Deactivation, Decommission,Decontamination, Demolition (D4)*** -- Status provided in ***Attachment 15.***

  - Pipe chases are going to be pulled out from the 334 Tank Farm.

  - The 303-M baghouse has more uranium. WCH is performing further investigation to establish a path forward for building demolition.

  - Larry Gadbois (EPA) and Alicia Boyd (EPA) brought up the fact that there are no sampling plans in place for the soil associated with the 3225 and M0-052 buildings. Jim Golden (WCH) stated that there were no immediate plans to sample the soils beneath the MO-052 trailer and 3225 Bottle Dock, as there were no known releases from those facilities. EPA and DOE-RL indicated that some soil sampling could be required in the future to conclude that the soils were not contaminated from neighboring facilities or activities.

- Jill Thomson (WCH) agreed to get back with Rudy Guercia (DOE) with regards to why there is no basis to support the theory of a "general airborne" contamination spread across the 300 Area. No sampling will be performed to address the soils beneath MO-052 as it is sitting on top of the 618-1 burial ground. -- See ***New Action Items***.

SPECIAL TOPICS

- ***Status of Tri-party Agreement (TPA) Milestone M-94-01***

  Rick Bond (Ecology) presented status.

- ***Air Emission Dose Methodology*** -- Status provided in ***Attachment 19.***

  Jack Donnelly (WCH) gave an introduction that John Price (Ecology) requested, via email, an explanation of how the data from the CERCLA cleanup projects was used in the annual reports, and further requested the Washington State Department of Health (DOH) to attend as well. Additionally, EPA wanted to be included. Jack Donnelly introduced Larry Diediker (FH), Kathy Rhodes (PNNL), and Mary Jarvis (DOE). Introductions were conducted for all in attendance. Larry Diediker (FH) gave a presentation. Discussions progressed into how the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) dose estimates were calculated and checked, and that the data, while reported in the annual report, are not used in the dose for the offsite fugitive and diffuse emission in the annual report. Kathy and Larry explained the reasoning and rationale. DOH staff asked a few questions on the perimeter air monitors and noticed a large gap in air covered in the northern boundary of the site. Larry Diediker explained the reasoning, and no additional actions were discussed. John Price (Ecology) understood that air monitoring for industrial hygiene is performed closest to the worker, followed by the project specific air monitors, and then the overall perimeter air monitors.

- ***MP-14 Update Regulatory Approval Status***

  John Sands (WCH) to resend cover letter and copy of the MP-14 modification to Dennis Faulk (EPA) and John Price (Ecology) --See ***New Action Items.***

NEW ACTION ITEMS:

- (100 Area Groundwater,100-NR-2) ***Dennis Faulk (EPA)*** to check with Nick Ceto (DOE) about formulating a concurrence letter.

- (100 Area Groundwater, 100-NR-2) ***John Price (Ecology)*** stated that Ecology and DOE will draft initial review permit then invite EPA if concerns over RCRA impact the CERCLA.

- (100 Area Groundwater, 100-HR-3) ***John Price (Ecology)*** noted that 183H permit language needed clarification and need to meet with Chris Smith (DOE) and Arlene Tortoso (DOE). Dib Goswami(Ecology) requested copy of permit

- (300 Area Source and D4) ***Jack Donnelly(WCH)*** to set up a meeting to further discuss the use of XRF screening versus sampling every 150 cubic yards to verify waste profiles.

- (Field Remediation, 100K) ***Dennis Faulk (EPA)*** to ask for outside determination on K Basins compliance

- (D4) ***Jill Thompson(WCH)*** to get back to ***Rudy Guercia (DOE)*** with regards to why there is no basis to support the theory of a "general" airborne contamination spread across the 300 Area.

- (Special Topics) ***John Sands (WCH)*** to resend cover letter and copy "MP14' modification to Dennis Faulk (EPA) and John Price (Ecolgy)

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 4

Ron Jackson -Groundwater Operable Unit Status

Attachment 4

100 UMM
Groundwater Operable Unit Status
December 8, 2005

100-NR-2 Groundwater OU

- Remediation Treatment Status
  - The pump and treat system operated at ~60 gpm.
  - Average Sr-90 removal efficiency for the period October 27 through November 22 was 92%.
  - Average influent and effluent concentrations were 2050 pCi/L and 160 pCi/L, respectively.

- Ecological Impact Assessment
  - A review draft of the assessment findings was delivered to Ecology on October 31 to fulfill the October 2005 milestone.
  - A briefing on findings was held with Ecology staff, Department of Health, and other interested parties on November 1.
  - Late arrival of some data and additional evaluation will be added during the comment resolution process

- Apatite Treatability Testing Status
  - A public briefing and discussion of field testing plans for FY2006 was held on October 13, 2005 at the Richland Ecology Office.
  - The treatability test plan and schedule was updated based on new findings and to address some comments and concerns expressed at the public briefing. The revised draft is undergoing internal review.
  - Injection well locations for a 300-ft barrier and a pilot test injection array were staked and drilling packages prepared.

100-KR-4 Groundwater OU

- Remediation Treatment Status
  - For the period September 16-November 27, 2005:
    - Total average flow through the system dropped from about 300 gpm to 270 gpm due too low river stages and some down time.
    - Average influent hexavalent chromium concentration was 0.056 mg/L.
    - System operated at 88 percent for the reporting period. Part of the system down time related to power failure in October. In November, system back was back to over 95 percent efficiency.

- Calcium Polysulfide Treatability Test Status
  - Hexavalent chromium continues to remain low at the 100-KR-4 treatability test site.
  - Treatability test report is in preparation. Final report due on March 1, 2005 or sooner.

- KW Groundwater Remediation
  - Planning is to start in January for addressing the chromium plume in the KW Reactor Area.

100 UMM
Groundwater Operable Unit Status
December 8, 2005

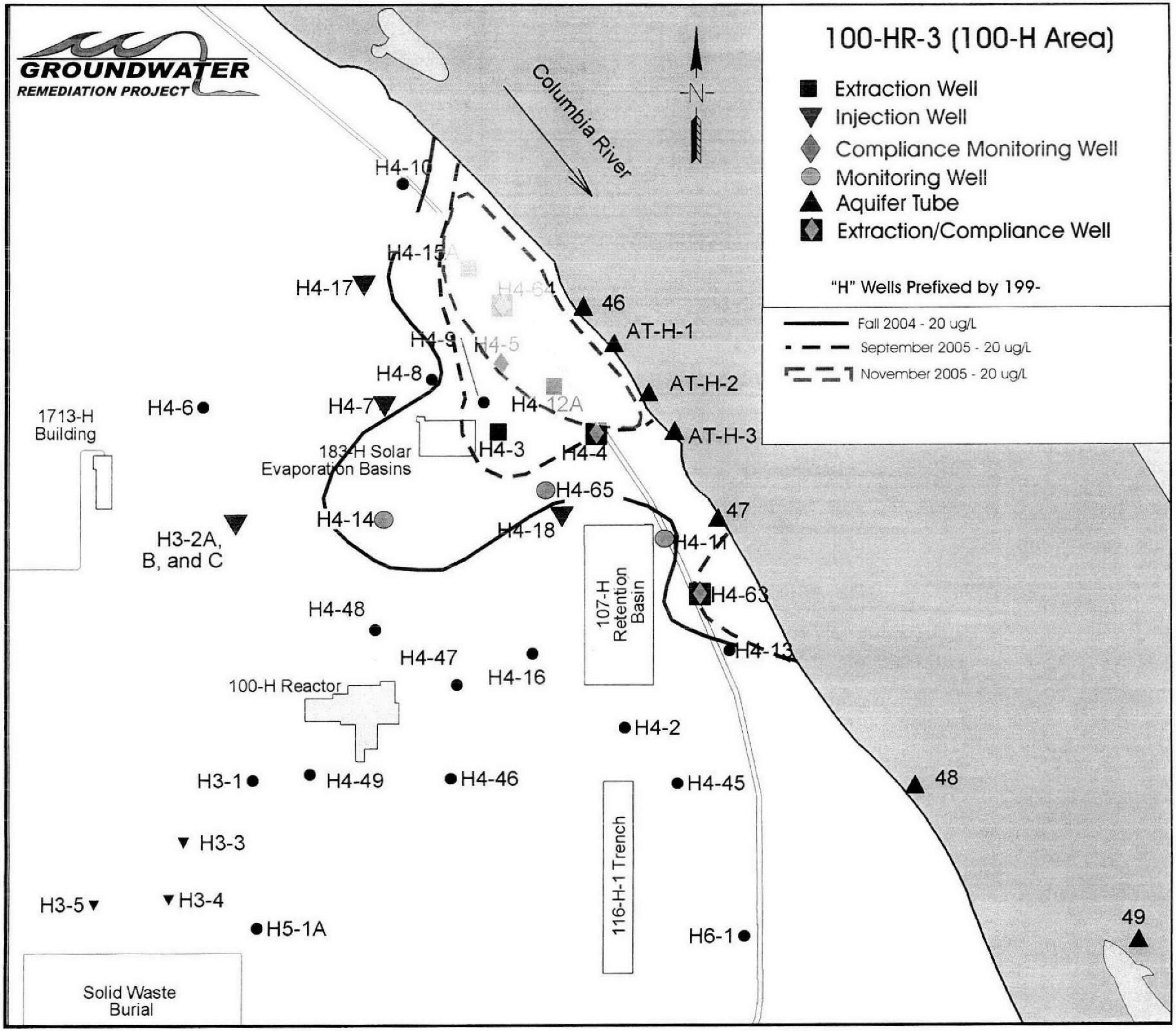
100-HR-3 Groundwater OU

- Remediation Treatment Status
  - For the period September 16-November 27, 2005:
    - System operated at 94 percent for the reporting period.
    - Total average flow through the system was approximately 166 gpm. Some wells temporarily down due to pump problems and electrical power failure in October.
    - Average influent hexavalent chromium concentration for H Area was 0.111 mg/L which is a blend of H and D water. Recent sampling of H influent shows hexavalent chromium concentration on December 5 at 0.031 mg/L. Average influent hexavalent chromium concentration for D Area was 0.184 mg/L
    - Realignment of injection and extraction wells was completed in late August 2005. Only a small amount of chromium remains in the extraction/compliance wells, e.g. below 0.030 mg/L. Aquifer tube data collected in September were below 0.020 mg/L at all aquifer tubes adjacent to the retention and solar evaporator basins.
    - On December 2, the D transfer shut down resulting in frozen transfer lines. This will be brought back on line once the weather warms, e.g. 40 degrees F. The HR-3 treatment system is currently pumping at about 75 gpm.

- DR-5 Treatment Status
  - For the period September 16-November 27, 2005:
    - System operated at 62 percent for the reporting period. Causes for down time include: construction upgrades, replacement of the programmable logic controller, electrical power failure, and addressing rad con issues associated with the filter sludge.
    - In November, system operating above 95 percent with an average flow of approximately 43 gpm.
    - The average influent hexavalent chromium concentration in November was 0.793 mg/L.

- Summary of ISRM Status
  - The final report of the PNNL laboratory evaluation of ISRM aquifer materials was transmitted electronically on November 30. The report number is PNNL-15499, and can be found at **(http://www.pnl.gov/main/publications/**.
  - The final report on iron augmentation for the ISRM barrier was completed on November 30. See Scott Petersen for a copy.
  - Draft report of results from the surface geophysical survey (SP and IP) to help map the chromium in the groundwater and the reduced zone was received on September 14, 2005.
  - Quarterly sampling was performed on all the ISRM wells in November. Well 199-D4-36 had chromium (320 ppb) detected in it for the first time.

Draft



GROUNDWATER
REMEDIATION PROJECT
100-HR-3 (100-H Area)
Extraction Well
Injection Well
Compliance Monitoring Well
Monitoring Well
Aquifer Tube
Extraction/Compliance Well
"H" Wells Prefixed by 199-
Fall 2004 - 20 ug/L
September 2005 - 20 ug/L
November 2005 - 20 ug/L
N
Columbia River
H4-10
H4-15A
H4-17
H4-64
46
AT-H-1
H4-9
H4-5
H4-8
AT-H-2
H4-6
H4-7
H4-12A
AT-H-3
1713-H
Building
H4-3
H4-4
183-H Solar
Evaporation Basins
H4-65
H4-14
47
H4-18
H3-2A,
B, and C
H4-11
107-H
Retention
Basin
H4-63
H4-48
H4-13
H4-47
H4-16
100-H Reactor
H4-2
H3-1
H4-49
H4-46
H4-45
48
H3-3
116-H-1 Trench
H3-5
H3-4
49
H5-1A
H6-1
Solid Waste
Burial

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 5

Bob Peterson-100/300 Area Groundwater,
River Corridor Shoreline Monitoring Status

100 and 300 Area Combined UMM Agenda for December 8, 2005 Meeting

(Bob Peterson input, 373-9020)

100 Area Groundwater

- K-Basins Monitoring
  - Conditions consistent with previous trends and expectations; most recent sampling event was October; continuing monthly sampling near KE Basin.
  - Distributed quarterly report for July, August, September 2005.
  - No new information on need to decommission wells, and on planning for replacement wells, as part of KE Basin demolition and excavation.

300 Area Groundwater

- Project Specific Items: Operations and Maintenance Requirements
  - Results of June 2005 semiannual sampling event are consistent with previous trends and expectations; next event during mid-December.
  - Aquifer tubes were sampled in September and results are available.
  - Draft revised sampling and analysis plan has been prepared for the 300-FF-5 Operable Unit and is currently undergoing internal review.
- Project Specific Items: Phase III Feasibility Study and Limited Field Investigation
  - Work Plan for LFI has been distributed for concurrence by regulatory agencies.
  - Drilling of characterization boreholes is expected to begin in January 2006, followed by the direct-push task.

River Corridor Shoreline Monitoring

- Aquifer Tubes
  - Completed sampling at 300 Area, 100-H, and part of 100-F
  - Next: 100-D, followed by 100-K
  - Reversed river discharge cycles and weather dependencies influence schedule
- Riverbank Springs
  - Most were collected during the past months during SESP field activities

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 6

Steve Clark-RESRAD Software Update

<u>Input from Steve Clark for 12/08/05 100 Area UMM</u>:

<u>Action Item</u>: "Change of RESRAD software to version 6.30 will require a change to the 100 Area RDR/RAWP."

I find nothing in Rev. 5 of the 100 Area RDR/RAWP that would infer that a change to the RDR/RAWP was required because a new version of RESRAD was issued by Argonne National Laboratory. However, it would make sense to update the information regarding the current version of RESRAD when the RDR/RAWP is revised.

My review of Rev. 5 of the 100 Area RDR/RAWP indicates that changes to the version of RESRAD only mean that the sections specifically discussing RESRAD should be updated when a new revision to the RDR/RAWP is done. The 100 Area RDR/RAWP accounts for use of the most current version of RESRAD by incorporating the following statements:

Section 2.1.2.2, fifth paragraph, of Rev. 5 of the 100 Area RDR/RAWP states: "The RESRAD model has been accepted by EPA and Ecology for performing dose assessments *to* support the 15 mrem/yr standard. The most current version of RESRAD will be used for conducting dose assessments."

Section B.7, first paragraph, of Rev. 5 of the 100 Area RDR/RAWP states: "The RESRAD version history available from the RESRAD Internet Web site is reproduced below with the most recent version and its issue date listed first. This history is supplemented with notes presented at *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1998) unit managers' meetings."

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 7

Jack Donnelly and John Price Email on "Contaminated Batteries"

Donnelly, Jack W

From: Price, John [Jpri461@ECY.WA.GOV]
Sent: Wednesday, October 26, 2005 11:49 AM
To: Donnelly, Jack W
Cc: Smith-Jackson, Noe'l; Gadbois.Larry@epamail.epa.gov; Smith, Douglas C (Chris)
Subject: RE: FW: Approval to Use new standard for rad. Contaminated batteries

Rather than including the original email, how about including the following statement (your original plus the EPA/Ecology exception about lead-acid):

In October, 2002, EPA promulgated a new LDR treatment standard for radioactively contaminated cadmium-, silver-, and mercury-containing batteries. The new standard allows for macroencapsulation of these batteries, and was based on EPA's conclusion that the previous standards were inappropriate due to technical and worker exposure issues. Ecology adopted these EPA standards without modification as part of their 2004-2005 revisions to WAC 173-303. The 100 Area RODs were approved prior to the adoption of these LDR treatment standards, thereby freezing the ARARs pursuant to 40 CFR 300.430(f). However, WCH believes that the new standards should be authorized for use throughout the 100 Area (where radioactively contaminated batteries are being encountered) for the same reason the EPA used to justify the standards, which was the previous standards were inappropriate for radioactively contaminated batteries. WCH proposes to use these standards for rad contaminated batteries as specified above, and document regulator approval in the UMM meeting minutes, and also include this provision into the waste management section of the 100 Area Remedial Design Report/Remedial Action Work Plan, Rev. 5. With regulator approval, WCH will perform macroencapsulation as required, and also incorporate the new provisions into the Remedial Design Report/Remedial Action Work Plan during the next revision. EPA & Ecology are in agreement, while noting that lead-acid batteries are not covered by the new standard, and would require initial treatment (draining corrosive liquids, and treating them separately prior to land-disposal) prior to macro-encapsulation.

-----Original Message-----
From: Donnelly, Jack W [mailto:jack.donnelly@wch-rcc.com]
Sent: Wednesday, October 26, 2005 11:43 AM
To: Price, John; Smith, Douglas C (Chris)
Cc: Donnelly, Jack W; Smith-Jackson, Noe'l; Gadbois.Larry@epamail.epa.gov
Subject: RE: FW: Approval to Use new standard for rad. Contaminated batteries

Thanks....John.

What I will plan to do, if ok, is to include the original email to you and EPA on the proposal and then just a statement from EPA and you that this is acceptable in the UMM....does that work.

-----Original Message-----
From: Price, John [mailto:Jpri461@ECY.WA.GOV]
Sent: Wednesday, October 26, 2005 11:41 AM
To: Smith, Douglas C (Chris)
Cc: Donnelly, Jack W; Smith-Jackson, Noe'l; Gadbois.Larry@epamail.epa.gov
Subject: RE: FW: Approval to Use new standard for rad. Contaminated batteries

I see consistency between my response and Larry's response.

Do you want to have Jack wordsmith a statement to put in the UMM meeting minutes?

-----Original Message-----
From: Smith, Douglas C (Chris) [mailto:Douglas_C_Chris_Smith@RL.gov]

Sent: Wednesday, October 26, 2005 8:21 AM
To: Price, John; Gadbois.Larry@epamail.epa.gov
Cc: Donnelly, Jack W
Subject: FW: FW: Approval to Use new standard for rad. Contaminated batteries

Are we ready to wrap this up tomorrow? Both agencies concur with EPA/Ecology listed responses below?

Thanks

Chris

-----Original Message-----
From: Donnelly, Jack W
Sent: Wednesday, October 26, 2005 8:17 AM
To: Smith, Douglas C (Chris)
Subject: RE: FW: Approval to Use new standard for rad. Contaminated batteries

No I had not....so I take it that both EPA and Ecology approve.....?
Can you verify this for me Chris....thanks.

-----Original Message-----
From: Price, John [mailto:Jpri461@ECY.WA.GOV]
Sent: Monday, October 17, 2005 2:52 PM
To: Gadbois.Larry@epamail.epa.gov; Smith, Douglas C (Chris)
Cc: einan.david@epamail.epa.gov; Faulk.Dennis@epamail.epa.gov
Subject: RE: FW: Approval to Use new standard for rad. Contaminated batteries

Ecology says:

The use of the new treatment standard for rad-contaminated cadmium, silver, and mercury containing batteries (MACRO) appears to be appropriate for these types of batteries in the 100 areas. This is why the new treatment standard was issued - to create a disposal pathway where there wasn't one.

As far as lead-acid batteries are concerned (which are not covered by this new treatment standard); lead-acid batteries must be drained prior to macroencapsulation under the "Radioactive Lead Solid" subcategory.
Any corrosive liquid drained from these batteries would need to be treated separately prior to land disposal.

-----Original Message-----
From: Gadbois.Larry@epamail.epa.gov
[mailto:Gadbois.Larry@epamail.epa.gov]
Sent: Thursday, September 29, 2005 2:12 PM
To: Smith, Douglas C (Chris)
Cc: einan.david@epamail.epa.gov; Faulk.Dennis@epamail.epa.gov; Price, John
Subject: Re: FW: Approval to Use new standard for rad. Contaminated batteries

EPA/Ecology:
We allow macro for lead, so I don't see a problem with the batteries.
The exception could be wet (lead-acid) batteries. Does there need to be some pre-treatment of the acid: pH neutralization, liquid absorption?
Since acid mobilizes metals, and is not liner friendly, I could envision a requirement to rupture batteries first so the acid mixes with the concrete. (Concrete would neutralize acid.)
--Larry--

"Smith, Douglas C (Chris)" <Douglas_C_Chris_Smith@rl.gov>	To Dennis Faulk/R10/USEPA/US@EPA, Larry Gadbois/R10/USEPA/US@EPA,

09/29/2005 01:59 PM

David Einan/R10/USEPA/US@EPA

cc

"Price, John (ECY)" <jpri461@ecy.wa.gov>

Subject

FW: Approval to Use new standard for rad. Contaminated batteries

See summary writeup from WCH.

Chris

From: Donnelly, Jack W
Sent: Thursday, September 29, 2005 1:41 PM
To: Smith, Douglas C (Chris)
Cc: Zeisloft, Jamie
Subject: Approval to Use new standard for rad. Contaminated batteries

Good afternoon Chris:

A question has arisen regarding use of new LDR treatment standards that were put into place after signature of the RODs, and that are not captured in the Waste Management Plan outlined in the 100 Area Remedial Design Report/Remedial Action Work Plan, Rev. 5.

The particular issue that has been raised concerns use of the new treatment standards for rad contaminated batteries, which allows macroencapsulation. Before this adoption, there was no standard and therefore no disposal path for rad contaminated batteries. Here is the information we are asking Ecolgy and EPA to approve to allow treatment of rad contaminated batteries and have a disposal pathway to ERDF:

> In October, 2002, EPA promulgated a new LDR treatment standard for radioactively contaminated cadmium-, silver-, and mercury-containing batteries. The new standard allows for macroencapsulation of these batteries, and was based on EPA's conclusion that the previous standards were inappropriate due to technical and worker exposure issues. Ecology adopted these EPA standards without modification as part of their 2004-2005 revisions to WAC 173-303. The 100 Area RODs were approved prior to the adoption of these LDR treatment standards, thereby freezing the ARARs pursuant to 40 CFR 300.430(f). However, WCH believes that the new standards should be authorized for use throughout the 100 Area (where radioactively contaminated batteries are being encountered) for the same reason the EPA used to justify the standards, which was the previous standards were inappropriate for radioactively contaminated batteries. WCH proposes to use these standards for rad contaminated batteries as specified above, and document regulator approval in the UMM meeting minutes, and also include this provision into the waste management section of the 100 Area Remedial Design Report/Remedial Action Work Plan, Rev. 5. With regulator approval, WCH will perform macroencapsulation as

required, and also incorporate the new provisions into the Remedial Design Report/Remedial Action Work Plan during the next revision.

Approval of this action is protective, and will provide a disposal path for this waste stream.

Can you please review, and if you concur, please pass along to Dave Einan, Dennis Faulk, Larry Gadbois, and John Price. Thanks.

Respectfully, Jack Donnelly

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 8

Kelly Cook and Lorna Dittmer Email on 100D Burial Grounds and Remaining Sites

Black, Sharon P

From: Cook, Kelly E
Sent: Wednesday, December 07, 2005 6:41 AM
To: Black, Sharon P
Cc: Carlson, Richard A; Dittmer, Lorna M; Donnelly, Jack W; Cook, Kelly E; Clapper, Nickolai D (Nick); Blakley, Tina M
Subject: Tentative: Updated: Combined 100Area /Groundwater / 300 Area Unit Manager Meeting

I will not be at the meeting. (duty calls)

My input is:

100-D Burial Grounds and Remaining Sites RFP has been funded and is in process of being "Issued for Bid".

The two "Priority Waste Sites Supplemental Design" (100-D-30 and 100-D-56), requested by Ecology to look for sodium dichromate, was recently completed and is being added to the design package prior to issuance. There is a Regulator briefing scheduled for Monday 12/12 at 9:00 to review the design package and path forward. The two potential sodium dichromate contribution sites will be given "start first" priority in the contract documents.

116-C-3 Design is waiting for some final chemical data but is progressing through costing with existing scope and drawings.

Will you please recite this information at the meeting for me?

Thanx

KC

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 9

Dean Strom Burial Grounds, Remaining Sites and RPAS Status List
and Color maps of B/C Area

12/8/2005

Blue Burial Grounds:

118-B-1:
Excavating and loading out material. Almost complete.

118-C-1:
Excavating and loading out material.

118-B-6:
Excavation is complete. Sample design underway.
COCs = Tritium, Hg, and Pb.

118-B-3
Backfill operations underway.

Red Remaining Sites:

- 126-B-3:
Backfill concurrence form.
Backfill is complete.

- 128-B-3:
The excavation on the side slope is ~~near~~ complete.

128-B-2:
Creating the close-out documentation for this site.

600-233:
Creating the close-out documentation for this site.

- 100-B-1:
Creating the close-out documentation for this site.
Backfilling is underway.

Green RPAS:

100-C-9:1N Box Culvert:
Creating the close-out documentation for this site.

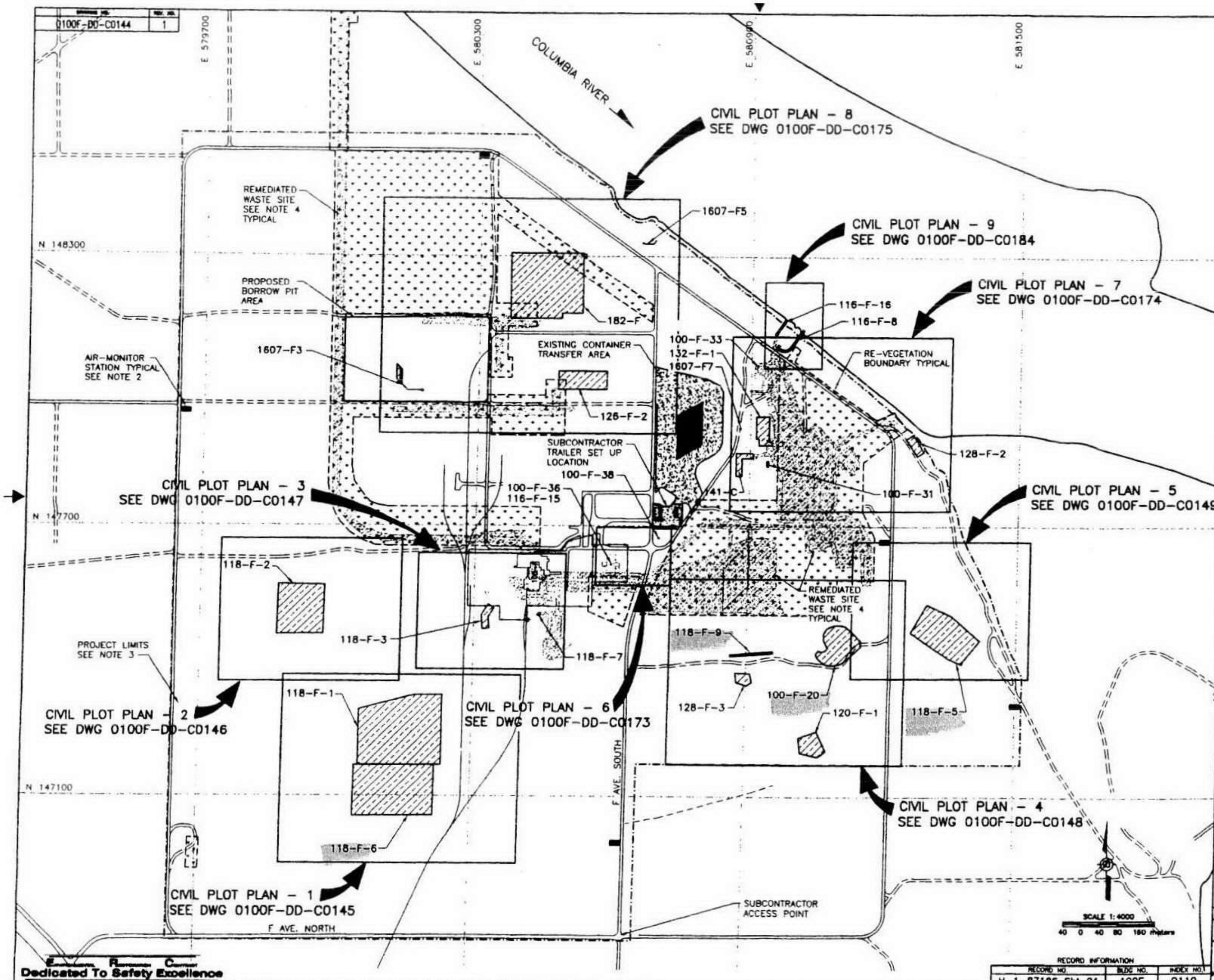
100-C-7:
Meeting Minutes and remedy option costs.

100-B-14
Approximately 95% complete with excavation.

1607-B2:
Creating the close-out documentation for the drainfield.
Piping near B-Reactor will remain.

Miscellaneous: Backfill concurrence form

Attachment #9



1. SEE DRAWING 0100F-DD-G0003 FOR GENERAL ABBREVIATIONS AND SYMBOLS LIST.
2. SUBCONTRACTOR TO INSTALL AIR MONITORS AND PROV ELECTRICAL POWER TO AIR MONITOR STATIONS SHOWN MAINTAIN STATIONS IN COMPLIANCE WITH THE SUBCON RACT DOCUMENTS. AIR MONITOR STATION EQUIPMENT PROVIDED BY CONTRACTOR. SUBCONTRACTOR SHALL M TAIN VEHICLE ACCESS TO AIR MONITOR STATIONS FOR DURATION OF PROJECT.
3. NO PROJECT ACTIVITIES MAY TAKE PLACE, INCLUDING PEDESTRIAN TRAFFIC, OUTSIDE OF THE PROJECT LIMITS WITHOUT WRITTEN AUTHORIZATION FROM THE CONTRACT
4. THESE WASTE SITES HAVE BEEN PREVIOUSLY REMEDIAT AND HAVE BEEN BACKFILLED AND/OR REVEGETATED. S CONTRACTOR SHALL KEEP EQUIPMENT OUT OF THESE EAS AND WILL NOT BE ALLOWED TO STAGE CONTAMINA WASTE IN THESE AREAS. THESE WASTE SITES ARE SHO FOR INFORMATION AND ARE NOT IN THIS SCOPE OF W
5. SUBCONTRACTOR SHALL SUPPLY SUPPORT TRAILER(S) THAT ARE IN ADDITION TO THE EXISTING CONTRACTOR SUPPORT FACILITY. INSTALLATION SHALL BE COORDINATI WITH THE CONTRACTOR.
6. SUBCONTRACTOR SHALL SUPPLY SURVEY AND DECONTA INATION STATION. DESIGN AND INSTALLATION SHALL BE COORDINATED WITH THE CONTRACTOR.
7. AIR MONITOR STATION 24 FROM PNNL (NOT SHOWN) WI BE USED AS UPWIND AIR MONITOR.

BHI-DIS 04-22-0

U.S. DEPARTMENT OF ENERGY
DOE FIELD OFFICE, RICHLAND
RICHLAND ENVIRONMENTAL RESTORATION PROJECT

BECHTEL HANFORD INC. RICHLAND, WASHINGTON | CH2M HILL HANFORD INC RICHLAND, WASHINGTON

100-F AREA
BURIAL GROUNDS AND REMAINING SITES
OVERALL SITE LOCATION PLAN

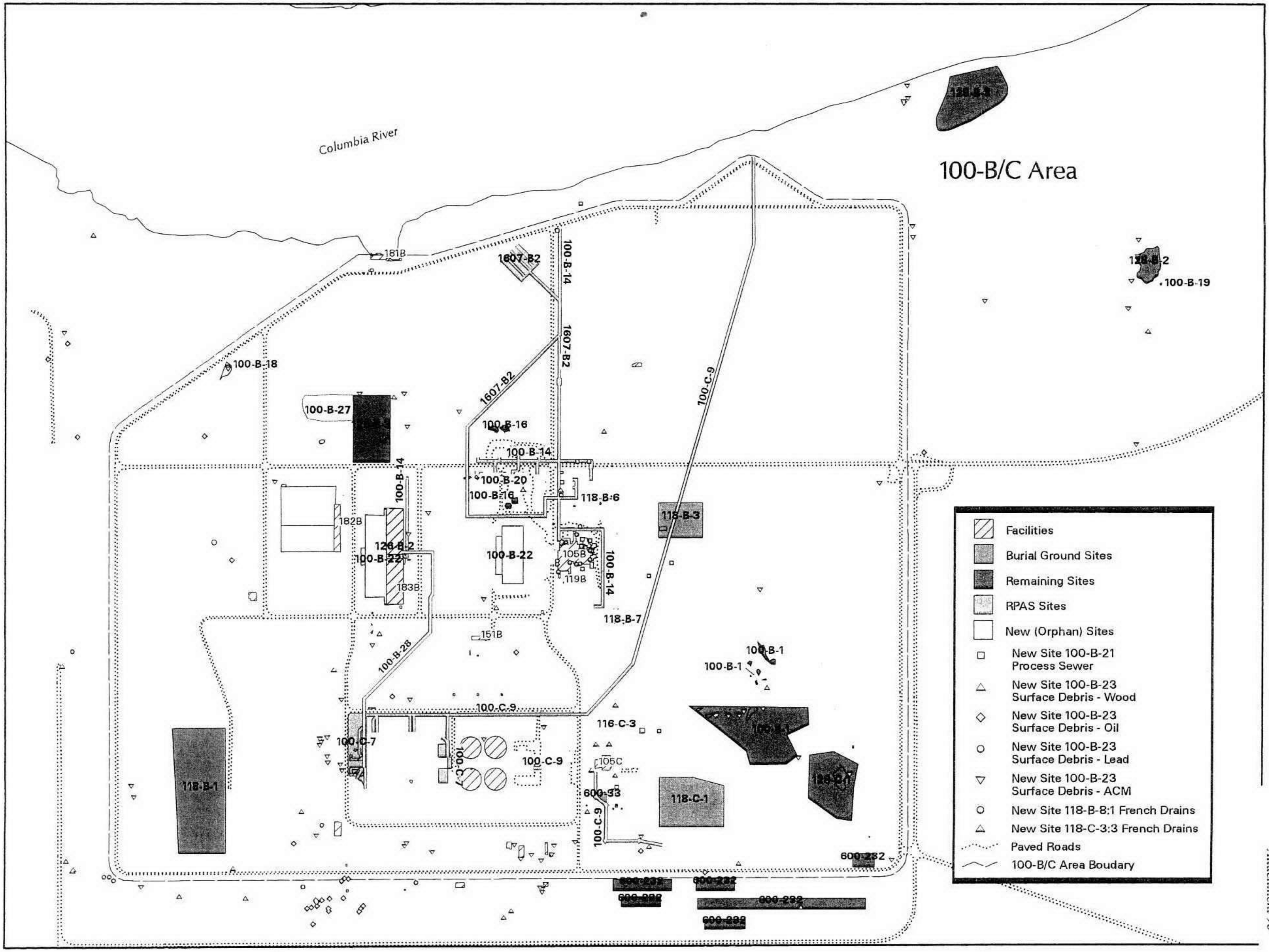
BECHTEL JOB NO.	DOE CONTRACT NO.	CADD FILENAME
22192	DE-AC06-93RL12367	1FDC0144.DWG

TASK	DRAWING NO.	REV. NO.
100F	0100F-DD-C0144	1

RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-1-87186 Sht 01	100F	0110

Environmental Restoration Contract
Dedicated To Safety Excellence



12/8/05

Attachment 9b

100/300 UMM

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 10

Dean Strom - 100-C-7 Borehole Meeting Minutes

100-C-7 Borehole Meeting Minutes

Purpose

On September 22, 2005, a meeting was held with the 100-BC Remedial Project, DOE, and EPA concerning the results from the 100-C-7 borehole sample data. The intent of these minutes is to document the decisions and the path forward agreed upon in the meeting.

Background

The original work scope for 100-C-7 Contamination Area was to remove 2.5 meters of contaminated soil across the entire footprint of the site. See Attachment 1, Site Drawings. Under the tank saddles, a yellow/green stained area was observed. The project elected to remove approximately 4.6 meters of material from this area. At 4.6 meters, the stained soil did not appear to be "cleaning-up." A pot hole was initiated to determine the extent of the contamination. Samples were collected at the surface (-4.6m Below Ground Surface) (total chromium 484 mg/kg, Cr+6 359 mg/kg), 3 meters (-7.6 m BGS) (total chromium 1090 mg/kg, Cr+6 1970 mg/kg), and 5.5 meters (-13.1 m BGS) (total chromium 1230 mg/kg, Cr+6 1620 mg/kg). At this point, it was obvious that the extent of the contamination was larger than originally assumed. Additional data was needed to further evaluate the vertical distribution of the chromium in the vadose zone. It was decided that a borehole to groundwater with samples taken every 1.5 meters (5 ft) would supply the information needed to determine the vertical extent of the chromium contamination.

In August of 2005, the borehole was initiated and completed.

Data

Soil samples were collected every 1.5 meters (5 ft) to groundwater and included collection of a filtered and unfiltered ground water sample. See Attachment 2 for sample results at depth.

The Well Summary Sheet detailing the geologic and hydrologic conditions of the borehole can be found in Attachment 3.

Attachment 4 contains the Log Data Report.

Analysis

RESRAD modeling was used to predict concentrations of hexavalent chromium in groundwater using the borehole sample data and assuming two different sets of input parameters. The MCL for Cr+6 that is protective of groundwater is 10 ug/L.

The first model used a hexavalent chromium Kd of 15.8 mL/g (calculated from the filtered groundwater and saturated zone soil analyses), assumed that only the bottom 1.5 m of the contaminated vadose zone remained with the existing concentration of 31.9 mg/kg Cr+6, that the site has only a soil cover, and there is no irrigation. After 40 years, the groundwater concentration is predicted to exceed 10 ug/L for Cr+6 which shows that excavation of all of the existing contaminated soil, all the way to groundwater, would be required to protect groundwater if digging was the only selected remedy.

The second model assumed that an ERDF cover is placed over the site, there is no irrigation, and the entire vadose zone is contaminated with 31.9 mg/kg Cr+6. Using a hexavalent chromium Kd of 3 mL/g, this scenario is predicted to be protective of groundwater. This shows that installation of a barrier to prevent infiltration and institutional controls to prevent irrigation would be protective of groundwater if it can be shown that the Kd of hexavalent chromium is 3 mL/g, or greater. Leach tests can be performed on contaminated soil from the site to determine the actual hexavalent chromium Kd.

Discussion

Based on the information above, it was evident that additional options needed to be explored. WCH was tasked with examining alternative approaches to remedy the chromium concerns at 100-C-7. Options may include: digging/removal of contaminated soil, installation of a barrier to prevent contamination of groundwater, chemical treatment to reduce hexavalent chromium, or a combination of applications.

The three options evaluated were:

1) Chemically treatment
2) Remove the highly contaminated material coupled with the use of a barrier
3) Excavate and remove all material to groundwater.

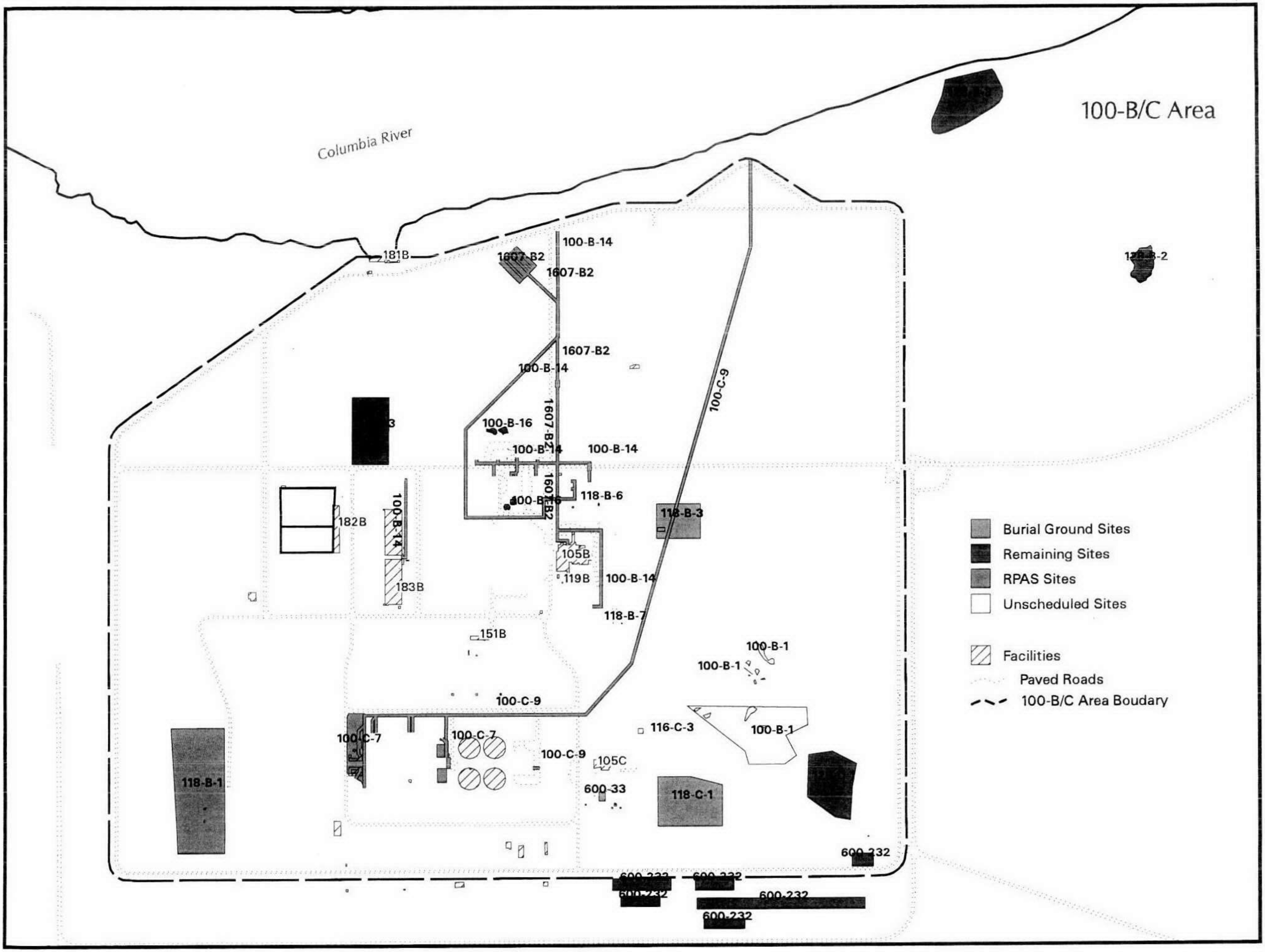
Conclusion

It was agreed by DOE and EPA that the extent of the contamination far exceeds the original work scope for this site and an alternate solution must be developed to remedy the site. It was recognized that the remedy is outside of the scope of TPA Milestone M-16-45 and does not have to be completed by the milestone date of December 31, 2006.

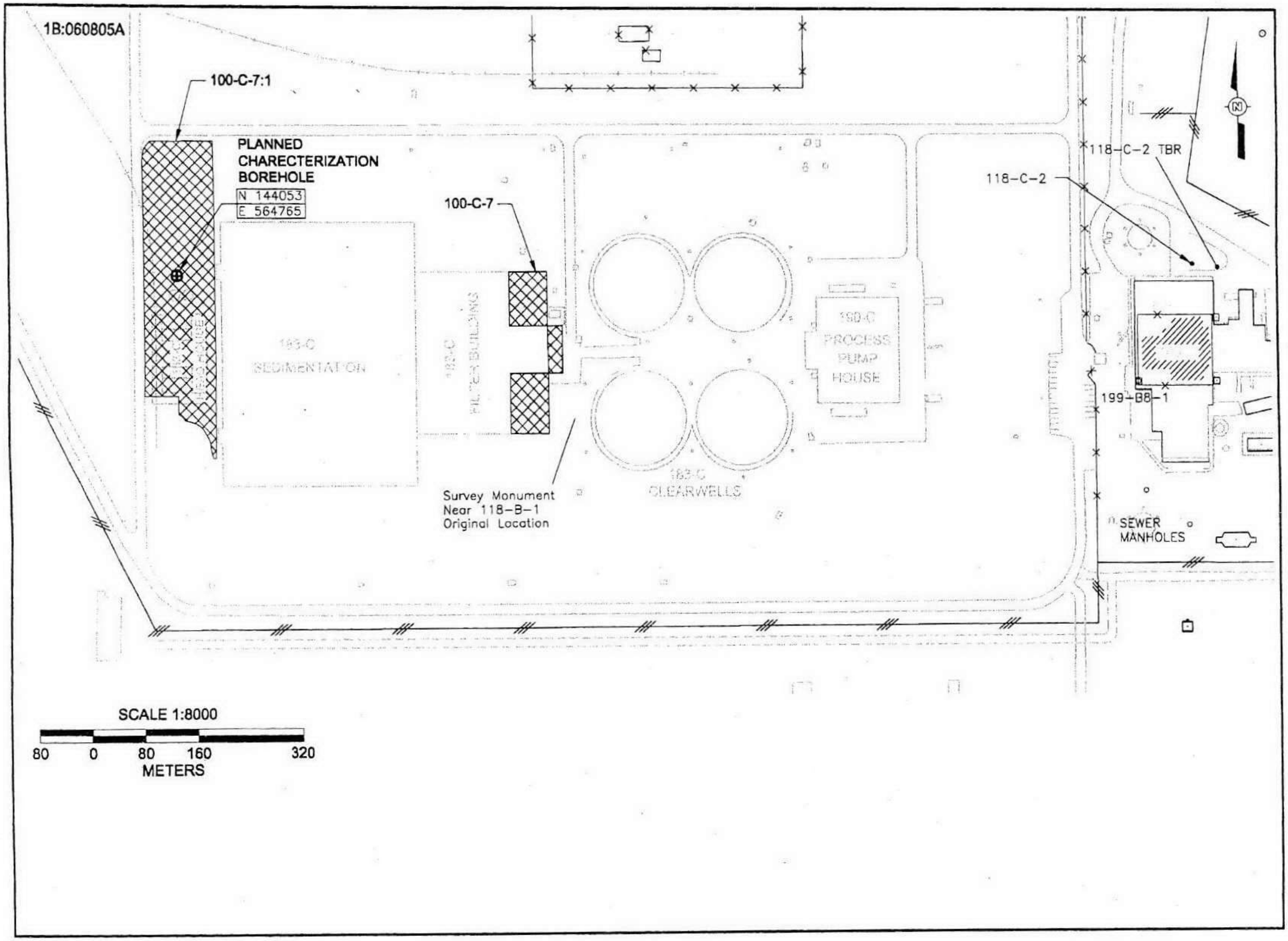
Based on a preliminary estimate, the Rough Order of Magnitude (ROM) estimate for the three options are:

1) Chemically Treat - $19.4M
2) Remove/Barrier - $18.6M
3) Remove to Groundwater - $25.9.

Attachment 1
Site Drawings



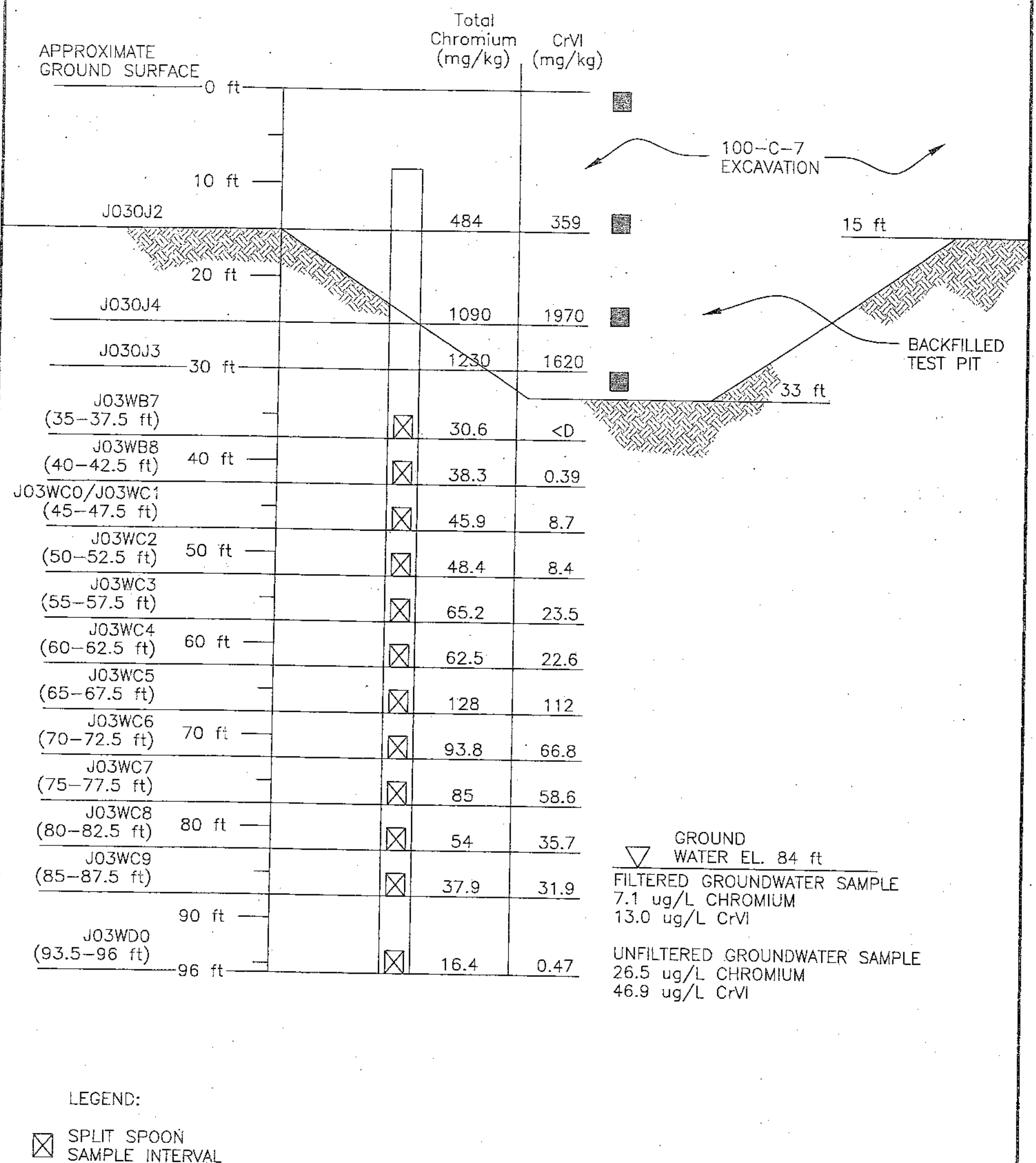
100-B/C Area
Columbia River
181B
1607-B2
100-B-14
100-B-16
100-C-9
118-B-6
118-B-3
182B
183B
105B
119B
118-B-7
151B
100-B-1
116-C-3
100-C-7
105C
600-33
118-C-1
118-B-1
600-232
Burial Ground Sites
Remaining Sites
RPAS Sites
Unscheduled Sites
Facilities
Paved Roads
100-B/C Area Boudary



Location of 183-C Water Treatment Facilities.

Attachment 2
Sample Results at Depth

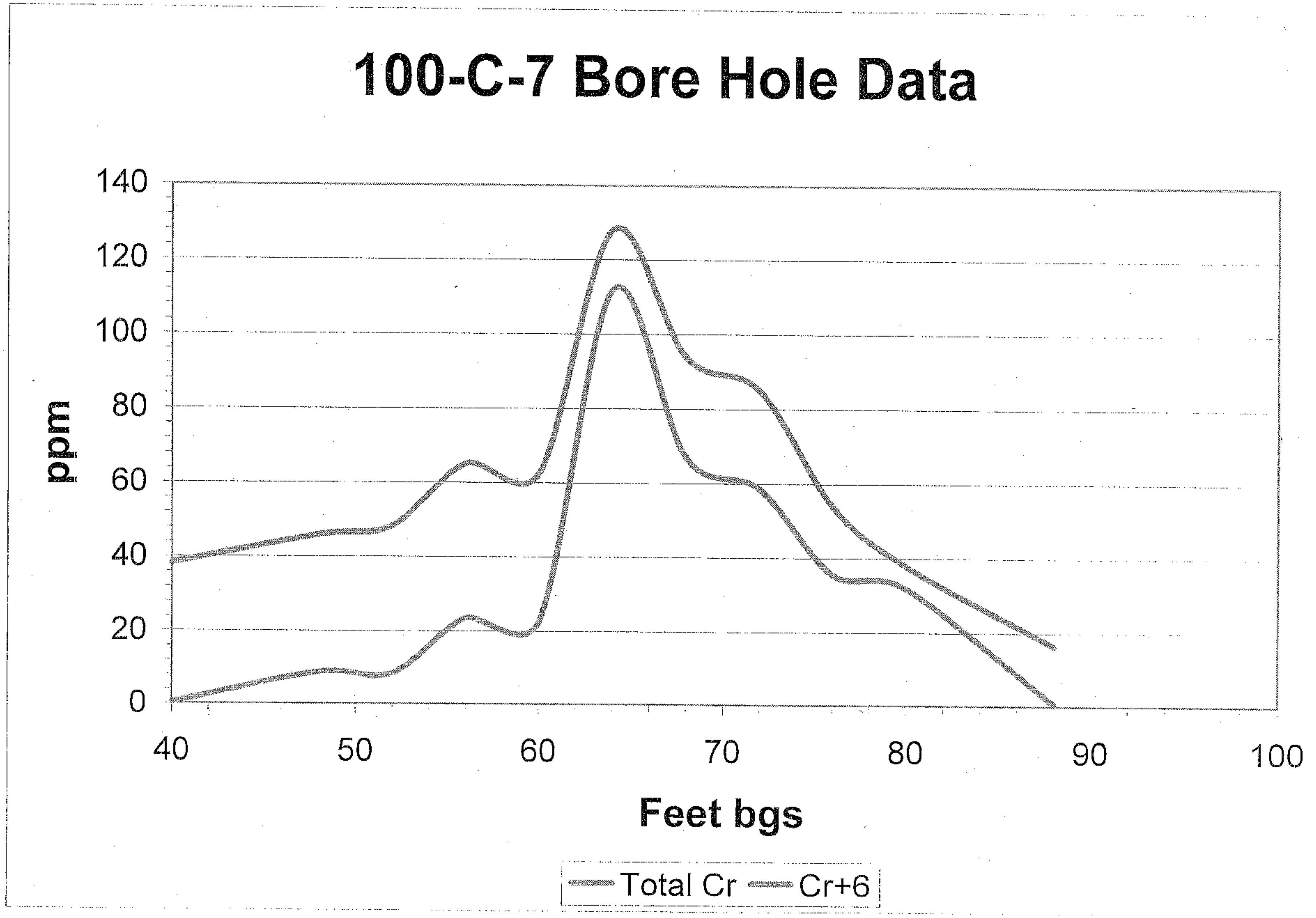
100BC\092205A.dwg



NOT TO SCALE

U.S DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

100-C-7 BOREHOLE (C4947) SOIL SAMPLE RESULTS



100-C-7 Bore Hole Data
140
120
100
80
60
40
20
0
ppm
40
50
60
70
80
90
100
Feet bgs
Total Cr
Cr+6

Attachment 3
Well Summary Sheet

WELL SUMMARY SHEET

Start Date: 08/09/05
Finish Date: 08/22/05
Page 1 of 1

Well ID: C4947	Well Name: C4947
Location: 100-C-7 (100 B/C Area)	Project: 100-C-7 characterization borehole.
Prepared By: Charlene Martinez — Date: 08/22/05	Reviewed By: L.D. Walker — Date: 8/30/05
Signature: Charlene Martinez	Signature: [signature]

CONSTRUCTION DATA

Description

10 7/8" / 9 3/4" temporary carbon steel casing used

Portland Cement
15' — 15.5'

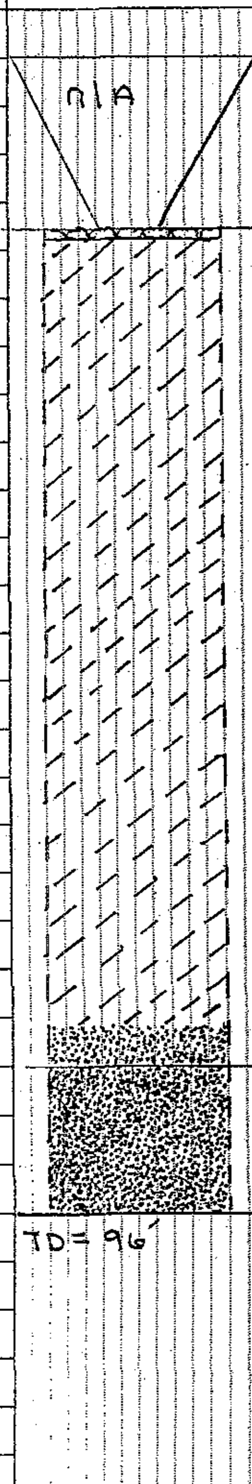
Granular Bentonite
15.5' ⟶ 81.3'

Colorado Silica Sand (10-20)
81.3' ⟶ 96'

All depths recorded in feet below original grade.

All temporary casing removed.

Diagram

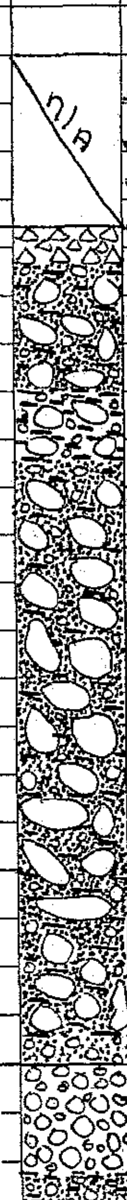


Depth in Feet

0
20
40
60
80
100

GEOLOGIC/HYDROLOGIC DATA

Graphic Log



Lithologic Description

0'-15' Pre-existing excavation. No lithology recorded in this interval. Borehole begins at 15' below original grade.

15'-17' Clean fill
17'-28' silty sandy Gravel (msG)
28'-33.9' silty Gravel (mG)
33.9'-82' slightly silty sandy Gravel (msG)

82'-84' Sandy Gravel (sG)
84'-93' Gravel (G)
93'-96' silty sandy Gravel (msG)

TD ⇒ 96' below original grade

Static water ⇒ 84' below original grade (08/17/05)

Attachment 4
Log Data Report

Stoller
Hanford Office

DOE-EM/GJ971-2005

C4947
Log Data Report

Borehole Information:

Borehole:	C4947		Site:	100 B/C Area	
Coordinates (WA St Plane)		GWL[1] (ft): 84		GWL Date:	08/18/05
North (m)	East (m)	Drill Date	Ground Level Elevation (ft)	Total Depth (ft)	Type
Not available	Not available	08/05	Not available	96	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded Steel	None	11	10	1/2	See notes	93

Borehole Notes:

Casing diameter and casing stickup measurements were acquired by the logging engineer using a caliper and steel tape. Measurements were rounded to the nearest 1/16 in.

This borehole was drilled at the bottom of an approximate 15-ft deep excavation. The log data are adjusted to a common reference depth, which is the static water level. The water level is reported in a Well Construction Summary Report at 84 ft, and the logging engineer measured water level at 68.5 ft. Therefore, all log data were adjusted 15.5 ft downward to coincide with the Well Construction Summary Report depths. All depths in this report have been adjusted and consequently do not coincide with original data files or field information.

The borehole was apparently drilled to a total depth of 96 ft with casing extending to 93.5 ft. The logging engineer started logging at 93 ft and the sonde did not enter into the open hole portion of the borehole.

Logging Equipment Information:

Logging System:	Gamma 4E		Type:	SGLS (70%) SN: 34TP40587A
Effective Calibration Date:	12/21/04	Calibration Reference:	DOE/EM-GJ854-2005	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Logging System:	Gamma 4M		Type:	NMLS SN: H340207279
Effective Calibration Date:	03/24/05	Calibration Reference:	DOE/EM-GJ856-2005	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat			
Date	08/18/05	08/18/05			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	93.0	36.0			
Finish Depth (ft)	16.0	28.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
ft/min	N/A[2]	N/A			
Pre-Verification	DE861CAB	DE861CAB			
Start File	DE861000	DE861078			
Finish File	DE861077	DE861086			
Post-Verification	DE861CAA	DE861CAA			
Depth Return Error (in.)	+ 1	0			
Comments	Fine gain adjustments after files -021 and -077.	No fine gain adjustment.			

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 Repeat			
Date	08/19/05	08/19/05			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	83.0	36.0			
Finish Depth (ft)	15.75	28.0			
Count Time (sec)	N/A	N/A			
Live/Real	R	R			
Shield (Y/N)	N	N			
Sample Interval (ft)	0.25	0.25			
ft/min	1.0	1.0			
Pre-Verification	DM022CAB	DM022CAB			
Start File	DM022000	DM022270			
Finish File	DM022269	DM022302			
Post-Verification	DM022CAA	DM022CAA			
Depth Return Error (in.)	- 1	0			
Comments	None	None			

Logging Operation Notes:

Logging was conducted with centralizers on the sondes. Repeat sections were collected in this borehole to evaluate system performance.

Analysis Notes:

Analyst:	Henwood	Date:	09/15/05	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging systems were performed before and after the day's data acquisition. The acceptance criteria were met.

A casing correction for 0.5-in.-thick casing was applied to the SGLS log data. There is no valid calibration for the neutron moisture data in a 10-in. borehole. Therefore, the data are plotted in counts per second (cps) and no correction factors are applied.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with an EXCEL worksheet template identified as G4EApr05.xls using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations. No corrections for dead time were necessary. A correction for water inside the casing is applied to the data below 84 ft.

Log Plot Notes:

Separate log plots are provided for the man-made radionuclide (^{137}Cs) detected in the borehole, naturally occurring radionuclides (^{40}K, ^{238}U, ^{232}Th [KUT]), a combination of man-made, KUT, total gamma and moisture, total gamma plotted with dead time, and moisture. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, casing corrections, or water corrections. Repeat section plots are provided where appropriate.

Results and Interpretations:

^{137}Cs was the only man-made radionuclide detected in this borehole. ^{137}Cs was detected using the routine processing software at 29 and 33 ft near the MDL of 0.2 pCi/g. However, further scrutiny of the energy peaks indicates the detections are a result of statistical fluctuations and are not valid. .

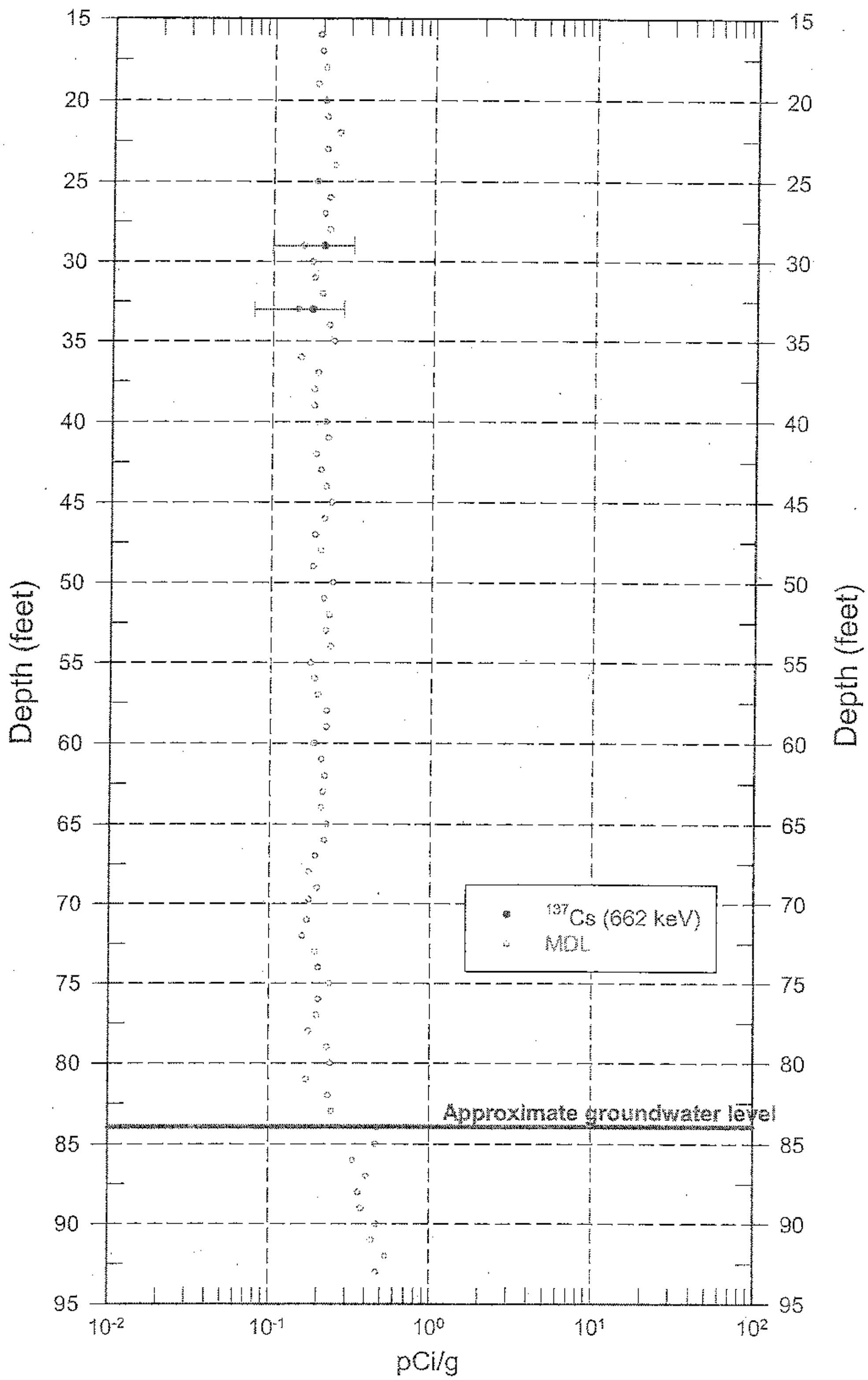
The moisture log data can be used qualitatively to determine relative moisture content.

The repeat sections generally indicate good agreement of the naturally occurring KUT and moisture.

---

[1] GWL – groundwater level

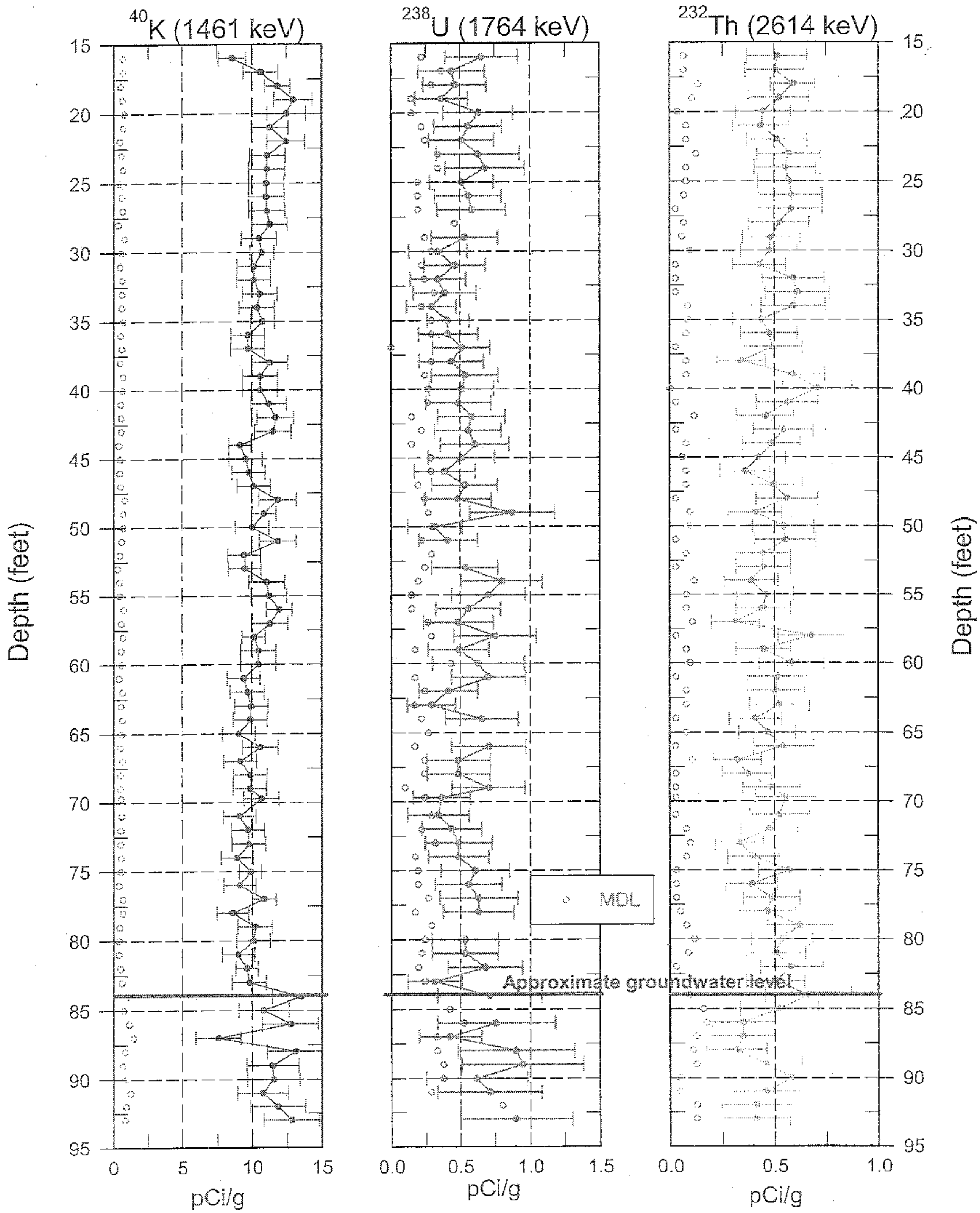
C4947
Man-Made Radionuclides



Zero Reference - ground surface

Depth scale: 1" = 10 ft

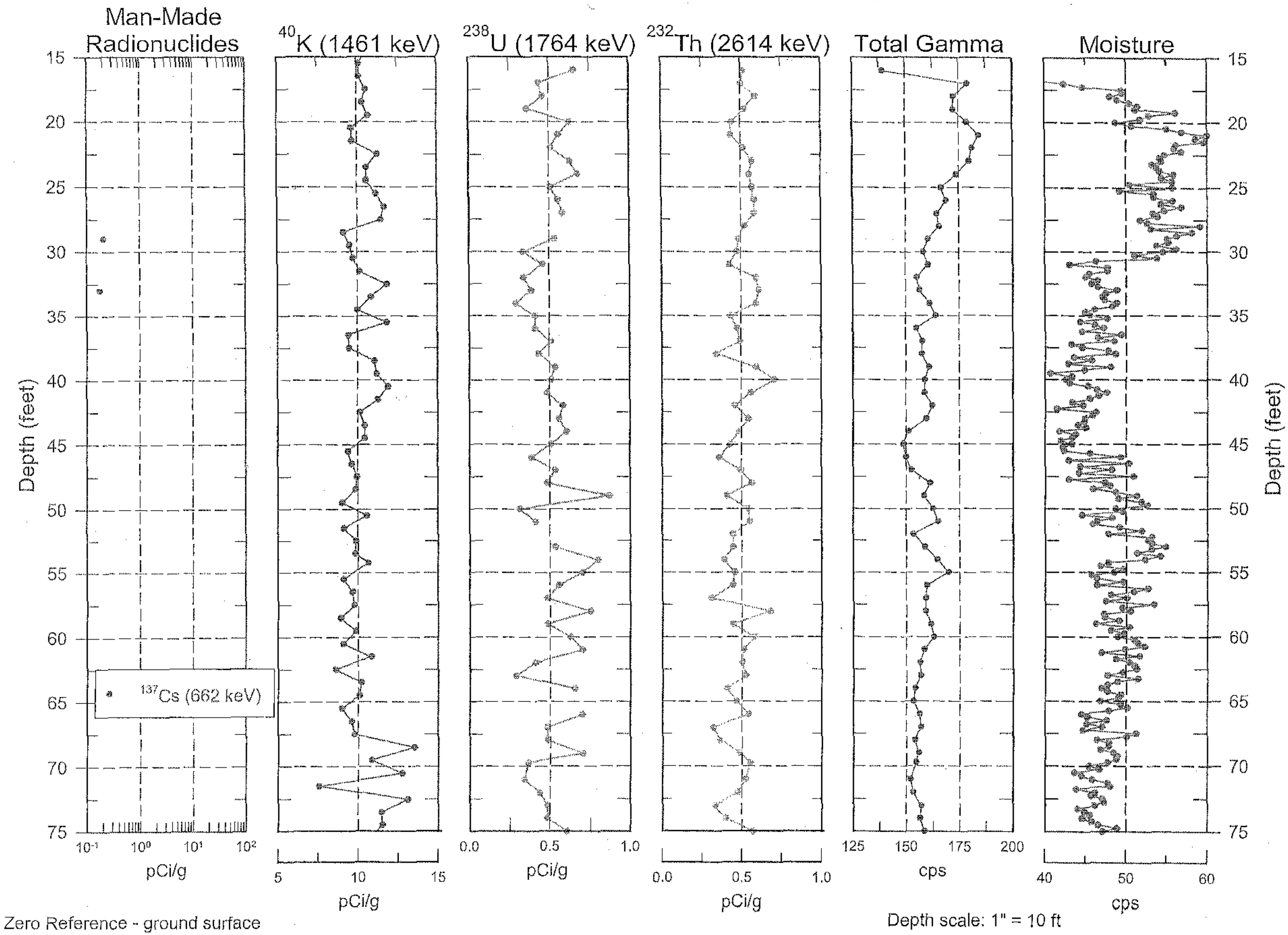
C4947
Natural Gamma Logs



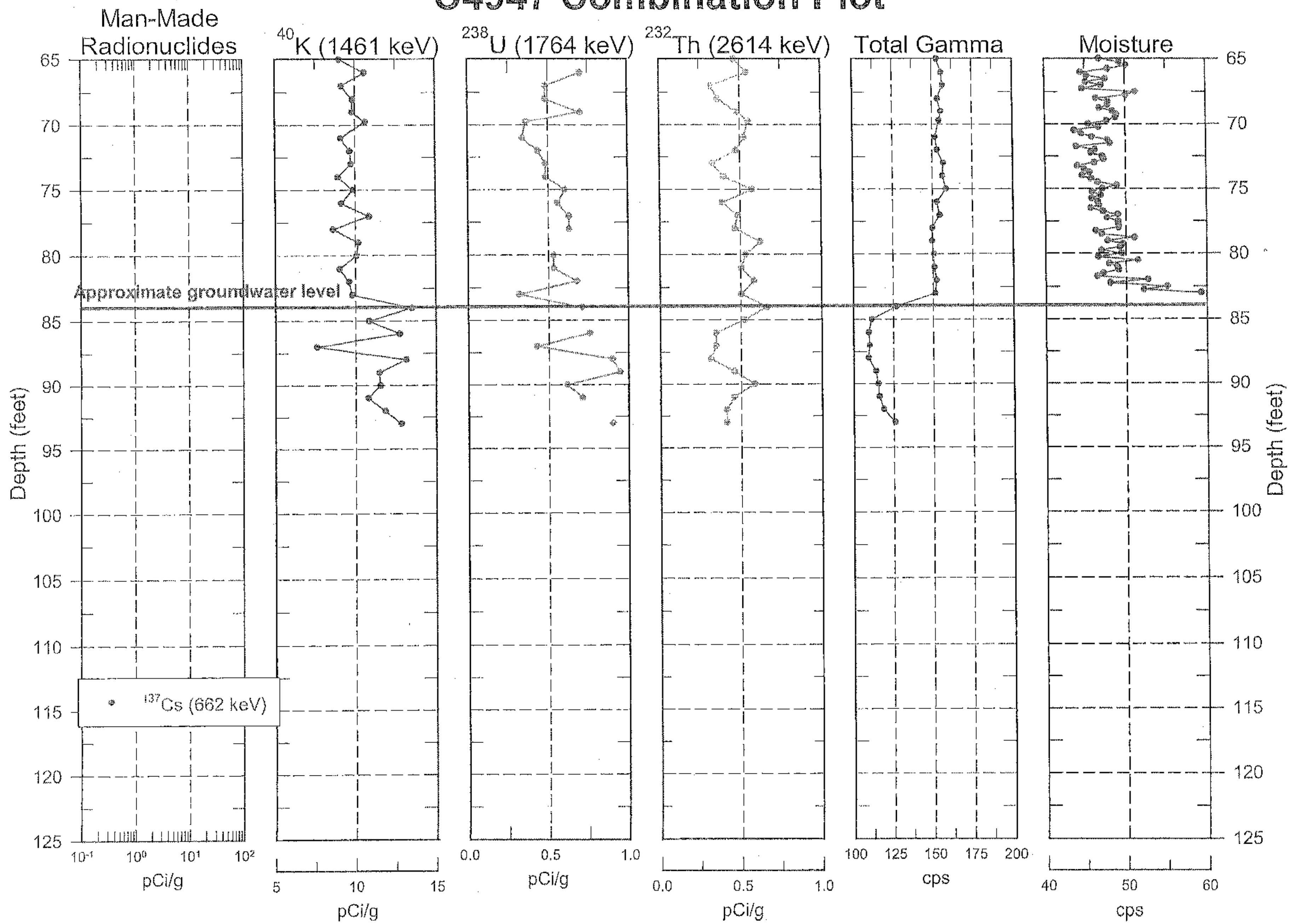
Zero Reference = ground surface

Depth scale: 1" = 10 ft

C4947 Combination Plot



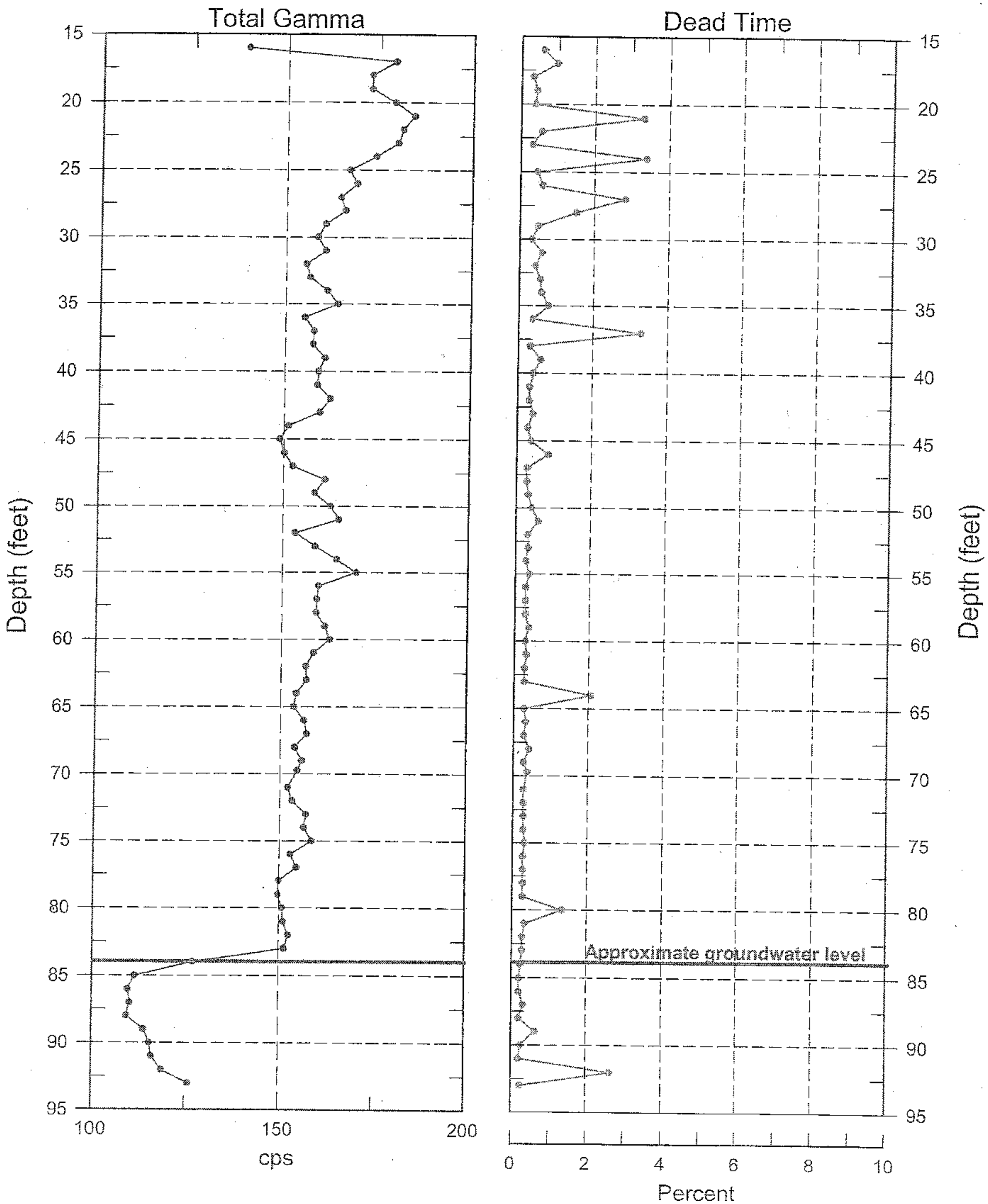
C4947 Combination Plot



Zero Reference - ground surface

Depth scale: 1" = 10 ft

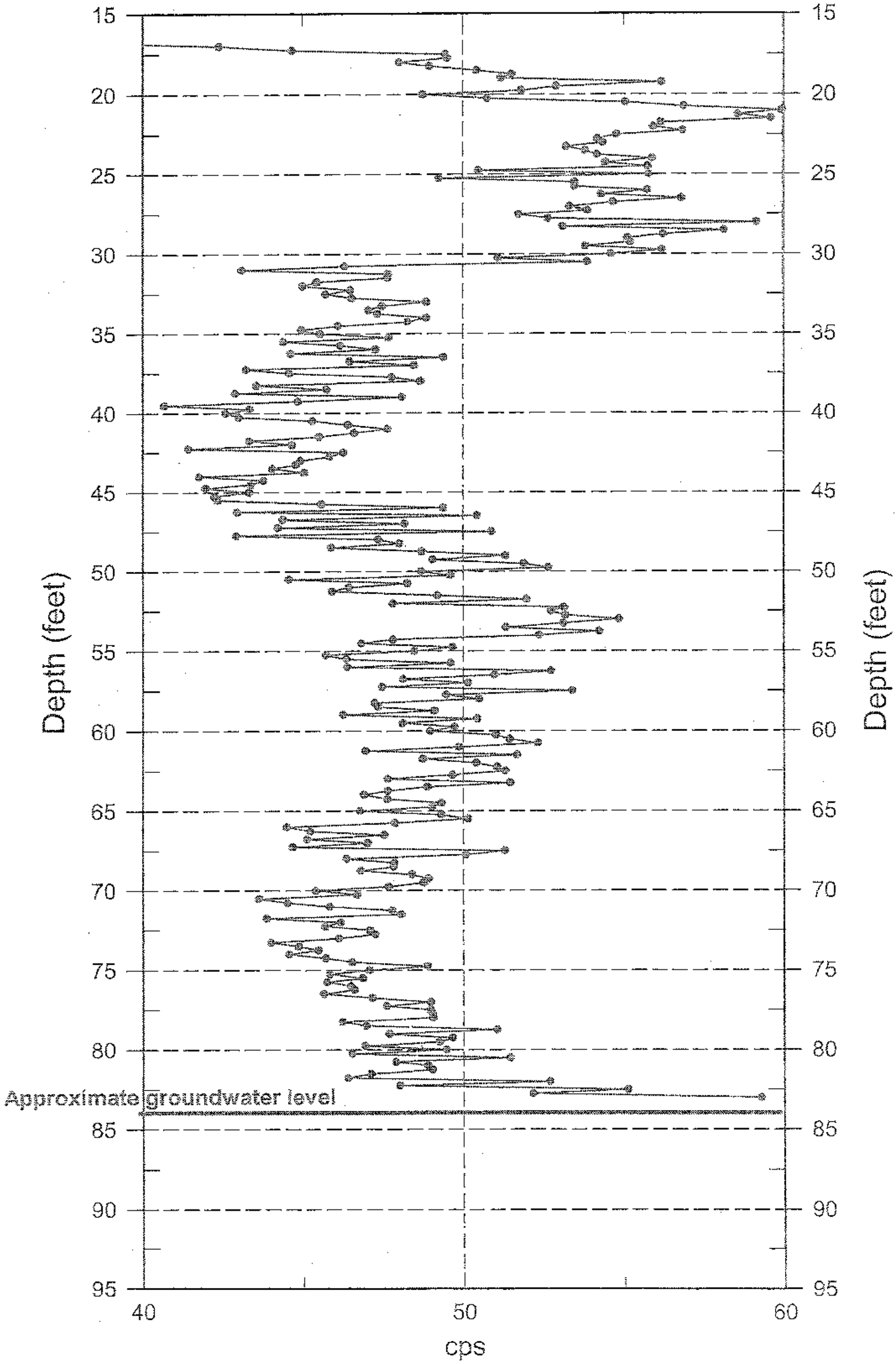
C4947
Total Gamma & Dead Time



Reference - ground surface

Depth scale: 1" = 10 ft

C4947
Moisture

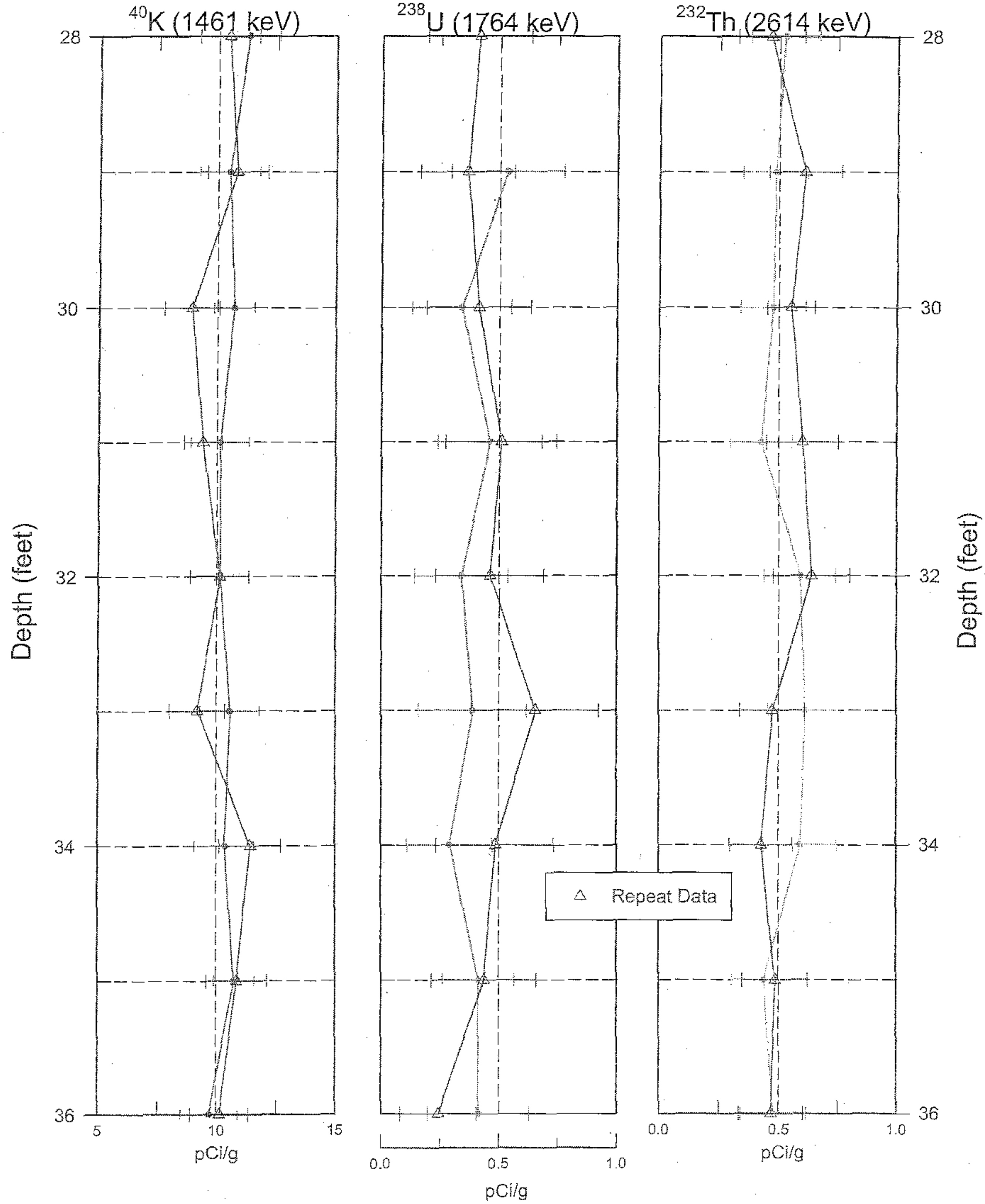


Zero Reference - ground surface

Depth scale: 1" = 10 ft

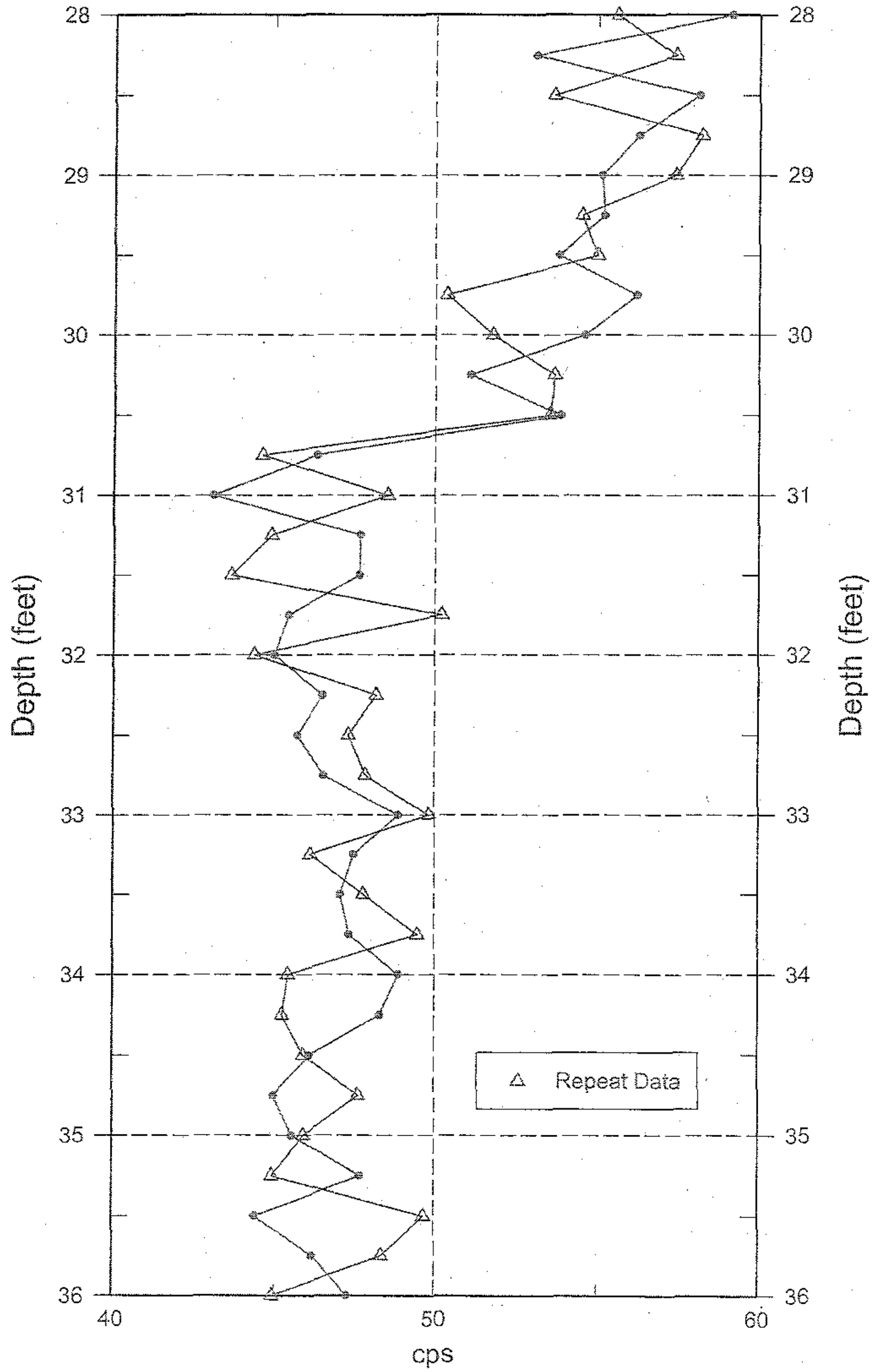
C4947

Repeat Section of Natural Gamma Logs



Zero Reference - ground surface

C4947
Moisture Repeat Section



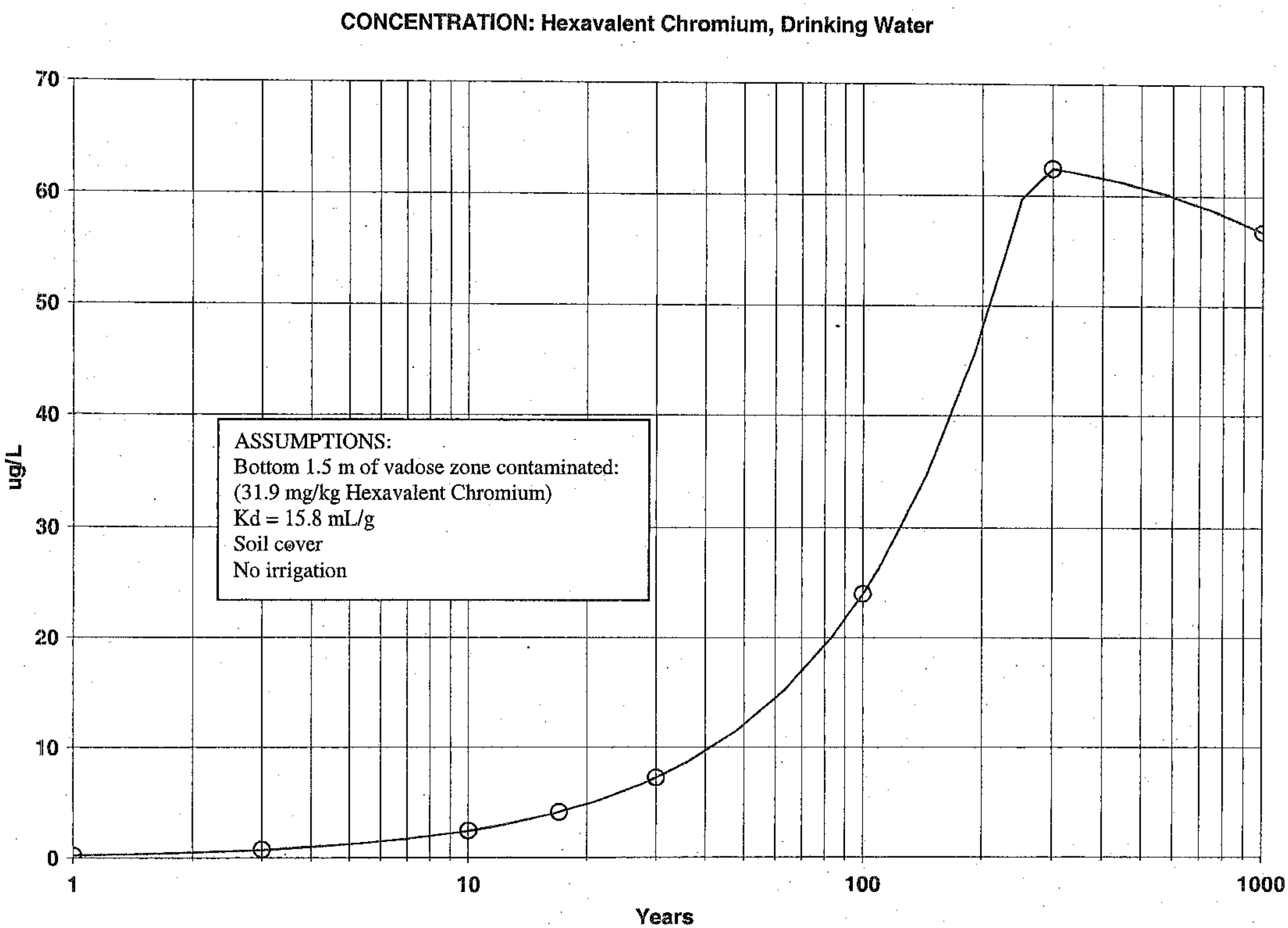
Zero Reference - ground surface

Depth scale: 1" = 10 ft

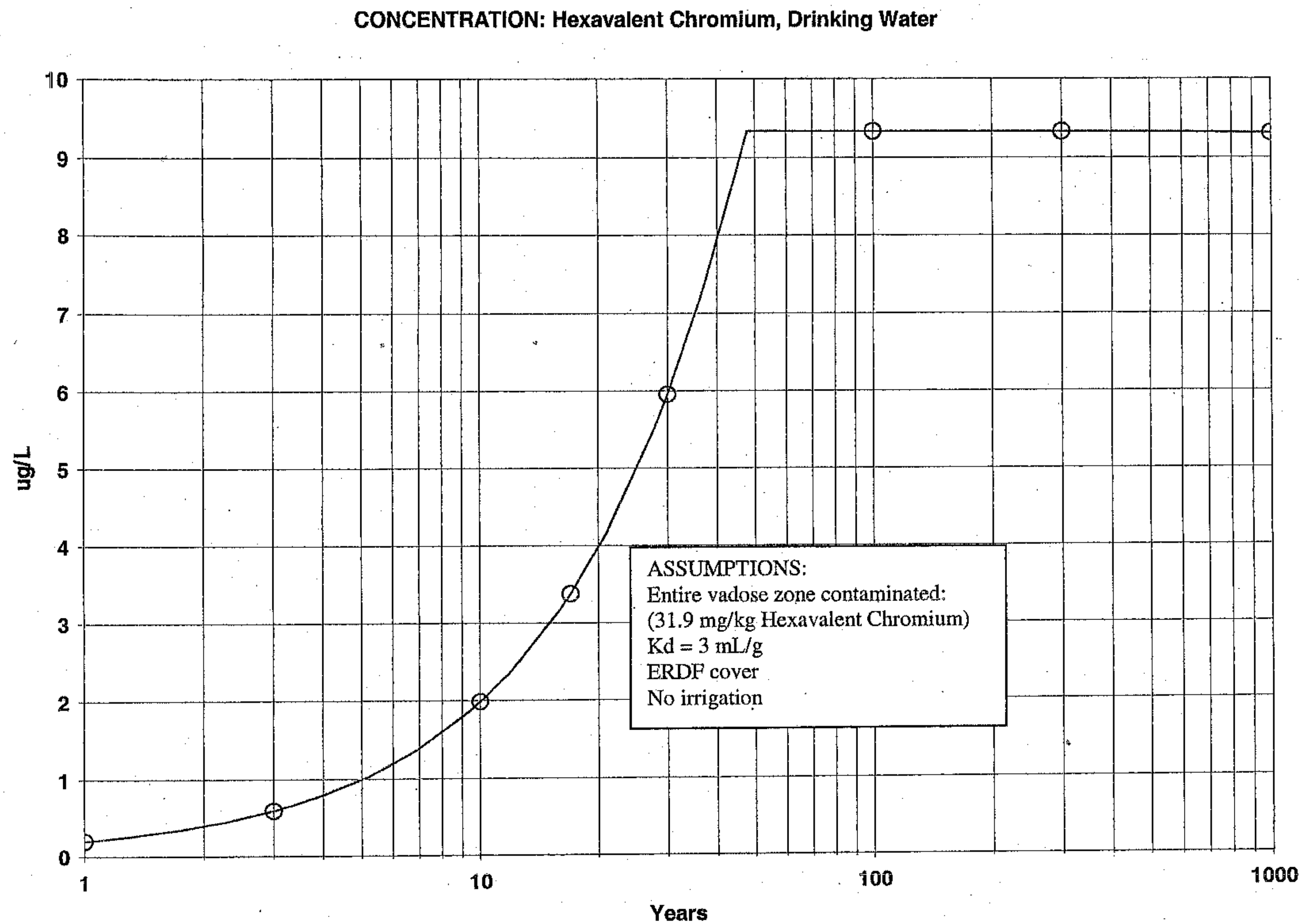
Attachment 5
RESRAD Modeling Options

Hexavalent Chromium Kd Values Predicted to be Protective of Groundwater at 100-C-7 Borehole

Sample Description	HEIS Number	Sample Depth (ft)	Sample Depth (m)	Contaminated Zone Thickness (m)	Cover (m)	Vadose Zone Beneath Contaminated Zone, (m)	Cr+6 (mg/kg)	Kd Predicted to be Protective of Groundwater (mL/g)
Soil	J030J2	15	4.6	4.6	0	22	359	1
Soil	J030J4	24	7.3	2.7	4.6	19.3	1970	1
Soil	J030J3	33	10.1	2.8	7.3	16.5	1620	1
Soil	J03WB7	37.5	11.4	1.3	10.4	15.2	0.2	0
Soil	J03WB8	42.5	12.9	1.5	11.4	13.7	0.39	0
Soil	J03WC0 (main)	47.5	14.5	1.6	12.9	12.1	8.7	1
Soil	J03WC1(dup)	47.5	14.5	1.6	12.9	12.1	8.4	1
Soil	J03WC2	52.5	16.0	1.5	14.5	10.6	23.5	1
Soil	J03WC3	57.5	17.5	1.5	16	9.1	22.5	2
Soil	J03WC4	62.5	19.0	1.5	17.5	7.6	112	2
Soil	J03WC5	67.5	20.6	1.6	19	6	66.8	2
Soil	J03WC6	72.5	22.1	1.5	20.6	4.5	58.6	3
Soil	J03WC7	77.5	23.6	1.5	22.1	3	35.7	4
Soil	J03WC8	82.5	25.1	3	23.6	0	31.9	90
Soil-aquifer interface	--	84	26.6	--	--	--	--	--
Soil in aquifer	J03WC9	87.5	26.7	--	--	--	0.47	(10.0) (33.8)
Soil in aquifer	JO3WD0	96	29.3	--	--	--	0.22	(4.7) (15.8)
Unfilterered groundwater	J03WK0/J03WJ7	> 84 ft*	NA	--	--	--	46.9 ug/L	--
Filtered groundwater	J02WJ9/J03WJ6	>84 ft*	NA	--	--	--	13.9 ug/L	--



100-C-7_Borehole.RAD 09/22/2005 09:23 GRAPHICS.ASC



100-C-7_Borehole_ERDF_Cover.RAD 09/22/2005 10:19 GRAPHICS.ASC

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 11

Dean Strom - Backfill Concurrence Checklist No 1607-B2:1
for Waste Site1607-B2:1 Septic Drain Field and
Backfill Concurrence Checklist Distribution Sheet for Waste Site 126-B-3

Attachment 11

Waste Site: 1607-B2:1 Septic Drain Field	BACKFILL CONCURRENCE CHECKLIST (Concurrence to Proceed with Waste Site Backfill Operations)	No: 1607-B2:1

This checklist is a summary of preliminary cleanup verification results for the 1607-B2:1 septic drain field. The checklist is intended as an agreement allowing the RCCC subcontractor to backfill the excavation using overburden and clean borrow fill prior to the issuance of the final remaining sites verification package.

Regulatory Requirement	Remedial Action Goals (RAGs)	Results	RAG Attained
Direct Exposure – Radionuclides	1. Attain 15 mrem/yr dose rate above background over 1000 years.	1. No radionuclide contaminants of potential concern (COPCs) were identified for the 1607-B2:1 waste site.	N/A
Direct Exposure – Nonradionuclides	1. Attain individual COPC RAGs.	1. All individual COPC concentrations are below the RAGS.	Yes
Meet Nonradionuclide Risk Requirements	1. Hazard quotient of less than 1 for noncarcinogens.	1. The hazard quotients for individual nonradionuclide COCs are less than 1.	Yes
	2. Cumulative hazard quotient of less than 1 for noncarcinogens.	2. The cumulative hazard quotients for the excavation and overburden are less than 1.	
	3. Excess cancer risk of <1 x 10^{-6} for individual carcinogens.	3. Excess cancer risk values for individual nonradionuclide COCs are less than 1 x 10^{-6}.	
	4. Attain a total excess cancer risk of <1 x 10^{-5} for carcinogens.	4. Total excess cancer risk is less than 1 x 10^{-5} for the excavation and overburden material.	
Groundwater/River Protection – Radionuclides	1. Attain single COPC groundwater & river RAGS.	1. No radionuclide COPCs were identified for the 1607-B2:1 waste site.	N/A
	2. Attain National Primary Drinking Water Regulations 4-mrem/yr (beta/gamma) dose standard to target receptor/organ.	2. No radionuclide COPCs were identified for the 1607-B2:1 waste site.	
	3. Meet drinking water standards for alpha emitters: the more stringent of 15 pCi/L MCL or 1/25th of the derived concentration guide for DOE Order 5400.5.	3. No radionuclide COPCs were identified for the 1607-B2:1 waste site.	
	4. Meet total uranium standard of 21.2 pCi/L.	4. Uranium is not a COPC for the 1607-B2:1 waste site.	
Groundwater/River Protection – Nonradionuclides	1. Attain individual nonradionuclide groundwater and river cleanup requirements.	1. Statistical concentrations of multiple inorganic COPCs exceed soil RAGs for groundwater and/or river protection, but these contaminants are not predicted to reach groundwater (and thus the Columbia River) within a 1,000-year timeframe by the *100 Area Analogous Sites RESRAD Calculations*.	Yes

Regulatory requirements identified above have been attained based on preliminary analytical data.

[signature]	9.29.05	[signature]	9-29-05	[signature]	10/3/05
WCH Manager	Date	WCH Project Engineer	Date	DOE Project Manager	Date

Given the attainment of regulatory requirements, DOE can proceed with backfill of the site with minimal risk. Final approval that the site has met remedial action objectives and RAGs will occur with the submittal, review, and approval of the remaining sites verification package by the lead regulatory agency.

[signature]	10-24-05	N/A	
EPA Project Manager	Date	Ecology Project Manager	Date

Backfill Concurrence Checklist
Distribution Sheet

Waste Site: 126-B-3

TITLE	NAME	MSIN	COPIES
Originator	D. N. Strom (for delivery at next 100 Area UMM)	X3-40	**1**
Document Control	Project File	H0-30	**Original**
Other	K. A. Anselm	H9-02	**1 w/o attach.**
	L. R. Miller	X3-40	**1 w/o attach.**

0567723

Waste Site: 126-B-3, 184-B Coal Pit	**BACKFILL CONCURRENCE CHECKLIST** (Concurrence to Proceed with Waste Site Backfill Operations)	WIDS No: 126-B-3

This checklist is a summary of cleanup verification results for the excavated portion of the 126-B-3 waste site. The checklist is intended as an agreement allowing the RCCC subcontractor to backfill the excavation prior to the issuance of the final remaining sites verification package. Copies of calculations are included with this checklist with results summarized below.

Regulatory Requirement	Remedial Action Goals (RAG)	Results	RAG Attained	Ref.
Direct Exposure – Radionuclides	1. Attain 15 mrem/yr dose rate above background over 1000 years.	1. No radionuclide contaminants of concern (COCs) were identified for the 126-B-3 waste site.	N/A	
Direct Exposure – Nonradionuclides	1. Attain individual COC RAGs.	1. All individual COC concentrations are below the RAGS.	Yes	A, B
Meet Nonradionuclide Risk Requirements	1. Hazard quotient of less than 1 for noncarcinogens.	1. The hazard quotients for individual nonradionuclide COCs in the shallow zone are less than 1. No nonradionuclide COCs were identified for overburden material.	Yes	C
	2. Cumulative hazard quotient of less than 1 for noncarcinogens.	2. The cumulative hazard quotient is less than 1 for the shallow zone. No nonradionuclide COCs were identified for overburden material.		C
	3. Excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens.	3. Excess cancer risk values for individual nonradionuclide COCs are less than 1×10^{-6}.		C
	4. Attain a total excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.	4. Total excess cancer risk is less than 1×10^{-5}.		C
Groundwater/River Protection – Radionuclides	1. Attain single COC groundwater & river RAGS.	1. No radionuclide COCs were identified for the 126-B-3 waste site.	N/A	
	2. Attain National Primary Drinking Water Regulations 4-mrem/yr (beta/gamma) dose standard to target receptor/organ.	2. No radionuclide COCs were identified for the 126-B-3 waste site.		
	3. Meet drinking water standards for alpha emitters: the more stringent of 15 pCi/L MCL or 1/25th of the derived concentration guide for DOE Order 5400.5.	3. No radionuclide COCs were identified for the 126-B-3 waste site.		
	4. Meet total uranium standard of 21.2 pCi/L.	4. Uranium is not a COC for the 126-B-3 waste site		
Groundwater/River Protection – Nonradionuclides	1. Attain individual nonradionuclide groundwater and river cleanup requirements.	1. Statistical concentrations of copper, benzo(a)anthracene, and chrysene exceed soil RAGs for groundwater and/or river protection, but these contaminants are not predicted to reach groundwater (and thus the Columbia River) within a 1,000-year timeframe by the *100 Area Analogous Sites RESRAD Calculations*.	Yes	A,B
Other Supporting Information	1. Verification sampling design.			D

All citations above and attached sheets are on record with Washington Closure Hanford., Document and Records Management. Above noted regulatory requirements have been attained.

WCH Manager	Date	WCH Project Engineer	Date	DOE Project Manager	Date
[signature]	9.28.05	[signature]	9-28-05	[signature]	9/29/05

Given the attached information, DOE can proceed with backfill of the site with minimal risk. Final approval that the site has met RAOs and RAGs will occur with the submittal, review, and approval of the Remaining Sites Verification Package by the lead regulatory agency.

EPA Project Manager	Date	Ecology Project Manager	Date
[signature]	9-28-05	N/A	N/A

Backfill Concurrence Checklist Attachments/References

Attachment/ Reference	Description
A	126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations
B	Comparison of Statistical Soil Values to Action Levels at the 126-B-3 Waste Site, Excavated Area.
C	126-B-3 (Excavated Area) Hazard Quotient and Carcinogenic Risk Calculation
D	Work Instruction for Verification Sampling of Waste Site 126-B-3, 184-B Coal Pit Dumping Area

Attachment A

126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations, Calculation No. 0100B-CA-V0260

CALCULATION COVER SHEET

Project Title:	100 B/C Remedial Action Project	**Job No.**	22192
Area	100 B/C		
Discipline	Environmental	***Calc. No.**	0100B-CA-V0260
Subject	126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations		
Computer Program	Excel	**Program No.**	Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These documents should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ **Preliminary** ☐ **Superseded** ☐ **Voided** ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 8 Attm. 1 = 13 Total = 22	[signature] 8/23/05 J. M. Capron	T.M. Blakley 8/23/05 T. M. Blakley T.B. Miley 8-24-05 T. B. Miley	T.M. Blakley for 8/24/05 L. M. Dittmer	[signature] D. N. Strom	8-25-05

SUMMARY OF REVISIONS

* Obtain calc no. from DIS

DE01437.03 (12/09/2004)

Bechtel Hanford, Inc. CALCULATION SHEET

Originator J. M. Capron JMC Date 08/23/05 Calc. No. 0100B-CA-V0260 Rev. No. 0
Project 100 B/C Remedial Action Project Job No. 22192 Checked T. M. Blakley TMB Date 8/23/05
Checked T. B. Miley TBM Date 8-24-05
Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations Sheet No. 1 of 8

Summary

Purpose:
Calculate the 95% upper confidence limit (UCL) to evaluate compliance with cleanup standards for the subject site. Also, perform the *Washington Administrative Code* (WAC) 173-340-740(7)(e) Model Toxics Control Act (MTCA) 3-part test for all nonradionuclide analytes and calculate the relative percent difference (RPD) for each contaminant of concern (COC) and contaminant of potential concern (COPC).

Table of Contents:

Given/References:
1) Sample Results (Attachment 1)
2) Lookup values, background values, and remedial action goals (RAGs) are taken from DOE-RL (2005b), DOE-RL (2001), and Ecology (1996).
3) DOE-RL, 2001, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, DOE/RL-92-24, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
4) DOE-RL, 2005a, *100 Area Remedial Action Sampling and Analysis Plan* (SAP), DOE/RL-96-22, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
5) DOE-RL, 2005b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP), DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
6) Ecology, 1992, *Statistical Guidance for Ecology Site Managers*, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
7) Ecology, 1993, *Statistical Guidance for Ecology Site Managers, Supplement S-6, Analyzing Site or Background Data with Below-detection Limit or Below-PQL Values (Censored Data Sets),* Publication #92-54, Washington Department of Ecology, Olympia, Washington.
8) Ecology, 1996, *Model Toxic Control Act Cleanup Levels and Risk Calculations (CLARC II),* Publication #94-145, Washington State Department of Ecology, Olympia, Washington.
9) EPA, 1994, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA 540/R-94/013, U.S. Environmental Protection Agency, Washington, D.C.
10) WAC 173-340, 1996, "Model Toxic Control Act - Cleanup," *Washington Adminstration Code.*

Solution:
Calculation methodology is described in Ecology (1992, 1993), below, and in the RDR/RAWP (DOE-RL 2005b). Use data from attached worksheets to perform the 95% UCL calculation for each analyte, the WAC 173-340-740(7)(e) 3-part test for nonradionuclides, and the RPD calculations for each COC and COPC. The carcinogenic risk calculations are located in a seperate calculation brief as an appendix to the Remaining Sites Verification Package (RSVP).

Calculation Description:
The subject calculations were performed on data from soil verification samples from the subject waste site. The data were entered into an EXCEL 2003 spreadsheet and calculations performed by using the built-in spreadsheet functions and/or creating formulae within the cells. The statistical evaluation of data for use in accordance with DOE-RL (2005b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

Methodology:
For all nonradioactive analytes with > 50% of the data below detection limits, the statistical value was set equal to the maximum detected concentration from the sample data set. The evaluation of the portion of the data set below detection limits was performed based on direct inspection of the final validated laboratory data and further calculations were not performed. For nonradioactive analytes with < 50% of the data below detection limits, the statistical value calculated to evaluate the effectiveness of cleanup was the 95% UCL. For these data sets, all data reported as being below detection limits were set to ½ the detection limit value for calculation of the statistics (Ecology 1993). There are no radionuclide COCs/COPCs for this site.

For the statistical evaluation of duplicate sample pairs, the samples are averaged before being included in the data set, after adjustments for censored data as described above.

For nonradionuclides, the WAC 173-340 statistical guidance suggests that a test for distributional form be performed on the data and the 95% UCL calculated on the appropriate distribution using Ecology software. For large nonradionuclide data sets such as those for the 126-B-3 site (n > 10), distributional testing is done using Ecology's MTCAStat software (Ecology 1993).

The WAC 173-340-740(7)(e) 3-part test is performed for nonradionuclide analytes only and determines if:
1) the 95% UCL exceeds the most stringent cleanup limit for each nonradionuclide COC/COPC,
2) greater than 10% of the raw data exceed the most stringent cleanup limit for each nonradionuclide COC/COPC,
3) the *maximum* value of the raw data set exceeds two times the most stringent cleanup limit for each nonradionuclide COC/COPC.

The RPD is performed when both the main value and the duplicate are above detection limits and are greater than 5 times the target detection limit (TDL). The TDL is a laboratory detection limit pre-determined for each analytical method. These detection limit requirements are located in Table II.1 of the SAP (DOE-RL 2005a). The RPD calculations use the following formula:
RPD =[|M-S|/((M+S)/2)]*100

where, M = Main Sample Value S = Split (or duplicate) Sample Value

For quality assurance/quality control (QA/QC) split and duplicate RPD calculations, a value less than +/- 30% indicates the data compare favorably. For regulatory splits, a threshold of 35% is used (EPA 1994). If the RPD is greater than 30% (or 35% for regulatory split data), further investigation regarding the usability of the data is performed. No regulatory split samples were collected for cleanup verification of the subject site. Additional discussion as necessary is provided in the data quality assessment section of the applicable RSVP.

Summary (continued)

Results:
The results presented in the summary tables that follow are for use in risk analysis and the RSVP for this site.

Results Summary			
Analyte	95% UCL[a]	Maximum[a]	Units
Arsenic	5.9E+00		mg/kg
Barium	9.34E+01		mg/kg
Beryllium	5.6E-01		mg/kg
Boron	4.9E+00		mg/kg
Cadmium	3.0E-01		mg/kg
Chromium	1.22E+01		mg/kg
Cobalt	1.16E+01		mg/kg
Copper	2.34E+01		mg/kg
Lead	8.3E+00		mg/kg
Manganese	4.67E+02		mg/kg
Mercury		3.E-02	mg/kg
Molybdenum		1.4E+00	mg/kg
Nickel	1.59E+01		mg/kg
Vanadium	6.69E+01		mg/kg
Zinc	6.24E+01		mg/kg
Aroclor-1260		1.7E-02	mg/kg
1,2,4-trichlorobenzene		5.2E-02	mg/kg
2-methylnaphthalene		3.9E-01	mg/kg
Acenaphthene		5.5E-02	mg/kg
Anthracene		1.5E-01	mg/kg
Benzo(a)anthracene		3.5E-01	mg/kg
Benzo(a)pyrene		2.8E-01	mg/kg
Benzo(b)fluoranthene		1.9E-01	mg/kg
Benzo(g,h,i)perylene		1.7E-01	mg/kg
Benzo(k)fluoranthene		2.4E-01	mg/kg
Carbazole		7.5E-02	mg/kg
Chrysene		3.7E-01	mg/kg
Dibenz(a,h)anthracene		8.8E-02	mg/kg
Dibenzofuran		9.9E-02	mg/kg
Diethylphthalate		4.1E-02	mg/kg
Fluoranthene		7.3E-01	mg/kg
Fluorene		7.1E-02	mg/kg
Indeno(1,2,3-cd)pyrene		1.6E-01	mg/kg
N-nitrosodiphenylamine		1.0E-01	mg/kg
Naphthalene		1.2E-01	mg/kg
Phenanthrene		6.2E-01	mg/kg
Pyrene		7.0E-01	mg/kg

WAC 173-340-740(7)(e) Evaluation

WAC 3-Part Test for most stringent cleanup limit:

95% UCL > Cleanup Limit?	YES	Because of the "yes" answers to the MTCA 3-part test for multiple contaminants, a detailed assessment using RESRAD will be performed for those contaminants.
> 10% above Cleanup Limit?	YES	
Any sample > 2x Cleanup Limit?	NO	

Note: All data sets meet the 3-part test criteria when compared to direct exposure cleanup limits.

[a]Where less than 50% of a data set is censored (below detection limits), the 95% UCL value is used for a given analyte. Where greater than 50% of a data set is censored, the statistical value defaults to the maximum value in the data set (determined by direct inspection of the attached data).

Relative Percent Difference (RPD) Results* - QA/QC Analysis	
Analyte	Duplicate Analysis
Barium	8.3%
Chromium	5.3%
Cobalt	6.2%
Copper	5.4%
Manganese	7.8%
Vanadium	16%
Zinc	28%

*RPD evaluation was not required for analytes not included in this table
MTCA = *Model Toxic Control Act*
QA/QC = quality assurance/quality control
RESRAD = RESidual RADioactivity
RPD = relative percent difference
UCL = upper confidence level
WAC = *Washington Adminstrative Code*

CALCULATION SHEET

Bechtel Hanford, Inc.

Originator J. M. Capron *JMC*
Project 100 B/C Remedial Action Project
Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations

Date 08/23/05
Job No. 22192

Calc. No. 0100B-CA-V0260
Checked T. M. Blakley *TMB*
Checked T. B. Miley *TBM*

Rev. No. 0
Date 8/23/05
Date 8-24-05
Sheet No. 3 of 8

Shallow Zone Sample Data

Sampling Area	HEIS Number	Sample Date	Arsenic mg/kg	Arsenic Q	Arsenic PQL	Barium mg/kg	Barium Q	Barium PQL	Beryllium mg/kg	Beryllium Q	Beryllium PQL	Boron mg/kg	Boron Q	Boron PQL	Cadmium mg/kg	Cadmium Q	Cadmium PQL	Chromium mg/kg	Chromium Q	Chromium PQL	Cobalt mg/kg	Cobalt Q	Cobalt PQL
1	J030P3	4/15/05	5.1E+00		1.9E+00	8.75E+01		1.3E-01	4.9E-01		7.E-02	5.4E+00		1.1E+00	4.1E-01		2.6E-01	1.55E+01		2.6E-01	1.18E+01		4.6E-01
2	J030P4	4/15/05	1.5E+00		1.4E+00	5.93E+01		1.E-01	3.1E-01		5.E-02	1.5E+00	UJ	1.5E+00	2.0E-01	U	2.0E-01	4.9E+00		2.0E-01	9.1E+00		3.5E-01
3	J030P5	4/15/05	3.0E+00		1.6E+00	7.09E+01		1.1E-01	4.6E-01		6.E-02	2.1E+00		9.4E-01	3.3E-01		2.2E-01	9.8E+00		2.2E-01	1.06E+01		3.9E-01
4	J030P6	4/15/05	6.2E+00		1.8E+00	1.30E+02		1.3E-01	5.8E-01		6.E-02	4.2E+00		1.1E+00	3.7E-01		2.5E-01	1.56E+01		2.5E-01	1.28E+01		4.4E-01
5	J030P7	4/15/05	2.7E+00		1.6E+00	7.51E+01		1.1E-01	4.3E-01		6.E-02	7.8E+00		9.5E-01	3.4E-01		2.2E-01	1.10E+01		2.2E-01	1.00E+01		3.9E-01
6	J030P8	4/15/05	4.1E+00		1.3E+00	5.49E+01		9.E-02	4.7E-01		5.E-02	4.5E+00		7.8E-01	1.8E-01	U	1.8E-01	5.0E+00		1.8E-01	1.01E+01		3.2E-01
7	J030P9	4/15/05	4.0E+00		1.6E+00	5.71E+01		1.1E-01	5.1E-01		5.E-02	3.6E+00		9.1E-01	2.1E-01	U	2.1E-01	4.1E+00		2.1E-01	1.02E+01		3.8E-01
8	J030R0	4/15/05	8.1E+00		1.6E+00	6.79E+01		1.1E-01	5.4E-01		5.E-02	3.8E+00		9.2E-01	2.2E-01	U	2.2E-01	5.5E+00		2.2E-01	1.10E+01		3.8E-01
9	J030R1	4/15/05	4.4E+00		1.7E+00	9.09E+01		1.2E-01	6.1E-01		6.E-02	5.2E+00		9.8E-01	2.3E-01	U	2.3E-01	6.6E+00		2.3E-01	1.12E+01		4.0E-01
10	J030R2	4/15/05	4.1E+00		1.7E+00	7.11E+01		1.2E-01	5.6E-01		6.E-02	4.2E+00		1.0E+00	2.3E-01	U	2.3E-01	8.8E+00		2.3E-01	9.9E+00		4.1E-01
11	J030R3	4/15/05	2.0E+00		1.6E+00	7.21E+01		1.1E-01	4.5E-01		6.E-02	3.7E+00		9.4E-01	2.5E-01		2.2E-01	1.01E+01		2.2E-01	9.9E+00		3.9E-01
12	J030R4	4/15/05	1.20E+01		1.8E+00	1.63E+02		1.2E-01	7.6E-01		6.E-02	5.5E+00		1.0E+00	3.9E-01		2.4E-01	2.07E+01		2.4E-01	1.56E+01		4.3E-01
13	J030R5	4/15/05	3.1E+00		1.6E+00	6.39E+01		1.1E-01	4.9E-01		6.E-02	6.3E+00		9.4E-01	2.9E-01		2.2E-01	8.7E+00		2.2E-01	1.09E+01		3.9E-01
14	J030R6	4/15/05	2.3E+00		1.6E+00	6.50E+01		1.1E-01	3.4E-01		6.E-02	3.3E+00		9.6E-01	4.2E-01		2.3E-01	8.6E+00		2.3E-01	8.9E+00		4.0E-01
15	J030R7	4/15/05	2.7E+00		1.8E+00	8.19E+01		1.3E-01	4.5E-01		6.E-02	1.6E+00	UJ	1.6E+00	3.6E-01		2.5E-01	5.8E+00		2.5E-01	1.09E+01		4.4E-01
Duplicate of J030R7	J030R8	4/15/05	2.8E+00		1.7E+00	8.90E+01		1.2E-01	5.0E-01		6.E-02	1.8E+00		1.0E+00	2.5E-01		2.4E-01	5.5E+00		2.4E-01	1.16E+01		4.2E-01

Statistical Computation Input Data

Sampling Area	HEIS Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg
1	J030P3	4/15/05	5.1E+00	8.75E+01	4.9E-01	5.4E+00	4.1E-01	1.55E+01	1.18E+01
2	J030P4	4/15/05	1.5E+00	5.93E+01	3.1E-01	7.5E-01	1.0E-01	4.9E+00	9.1E+00
3	J030P5	4/15/05	3.0E+00	7.09E+01	4.6E-01	2.1E+00	3.3E-01	9.8E+00	1.06E+01
4	J030P6	4/15/05	6.2E+00	1.30E+02	5.8E-01	4.2E+00	3.7E-01	1.56E+01	1.28E+01
5	J030P7	4/15/05	2.7E+00	7.51E+01	4.3E-01	7.8E+00	3.4E-01	1.10E+01	1.00E+01
6	J030P8	4/15/05	4.1E+00	5.49E+01	4.7E-01	4.5E+00	9.0E-02	5.0E+00	1.01E+01
7	J030P9	4/15/05	4.0E+00	5.71E+01	5.1E-01	3.6E+00	1.1E-01	4.1E+00	1.02E+01
8	J030R0	4/15/05	8.1E+00	6.79E+01	5.4E-01	3.8E+00	1.1E-01	5.5E+00	1.10E+01
9	J030R1	4/15/05	4.4E+00	9.09E+01	6.1E-01	5.2E+00	1.2E-01	6.6E+00	1.12E+01
10	J030R2	4/15/05	4.1E+00	7.11E+01	5.6E-01	4.2E+00	1.2E-01	8.8E+00	9.9E+00
11	J030R3	4/15/05	2.0E+00	7.21E+01	4.5E-01	3.7E+00	2.5E-01	1.01E+01	9.9E+00
12	J030R4	4/15/05	1.20E+01	1.63E+02	7.6E-01	5.5E+00	3.9E-01	2.07E+01	1.56E+01
13	J030R5	4/15/05	3.1E+00	6.39E+01	4.9E-01	6.3E+00	2.9E-01	8.7E+00	1.09E+01
14	J030R6	4/15/05	2.3E+00	6.50E+01	3.4E-01	3.3E+00	4.2E-01	8.6E+00	8.9E+00
15	J030R7/J030R8	4/15/05	2.8E+00	8.55E+01	4.8E-01	1.3E+00	3.1E-01	5.7E+00	1.13E+01

Statistical Computations

	Arsenic		Barium		Beryllium		Boron		Cadmium		Chromium		Cobalt	
Statistical value based on	Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat normal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.	
N	15		15		15		15		15		15		15	
% < Detection limit	0%		0%		0%		7%		40%		0%		0%	
mean	4.4E+00		8.09E+01		5.0E-01		4.1E+00		2.5E-01		9.4E+00		1.09E+01	
standard deviation	2.7E+00		2.93E+01		1.1E-01		1.8E+00		1.3E-01		4.7E+00		1.6E+00	
95% UCL on mean	5.9E+00		9.34E+01		5.6E-01		4.9E+00		3.0E-01		1.22E+01		1.16E+01	
maximum value	1.20E+01		1.63E+02		7.6E-01		7.8E+00		4.2E-01		2.07E+01		1.56E+01	
Statistical value	5.9E+00		9.34E+01		5.6E-01		4.9E+00		3.0E-01		1.22E+01		1.16E+01	
Background	NA		NA		NA		NA		NA		NA		NA	
Statistical value above background	5.9E+00		9.34E+01		5.6E-01		4.9E+00		3.0E-01		1.22E+01		1.16E+01	
Most Stringent Cleanup Limit for nonradionuclide and RAG type	20	BG/GW & River Protection	132	BG/GW Protection	1.51	BG/GW & River Protection	320	GW Protection	0.81	BG/GW & River Protection	18.5	BG/GW & River Protection	32	GW Protection
WAC 173-340 3-PART TEST														
95% UCL > Cleanup Limit?	NA		NO		NA		NO		NA		NO		NA	
> 10% above Cleanup Limit?	NA		NO		NA		NO		NA		NO		NA	
Any sample > 2X Cleanup Limit?	NA		NO		NA		NO		NA		NO		NA	
WAC 173-340 Compliance? **See next page**	Because all values are below background (20 mg/kg), the MTCA 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent cleanup levels.		Because all values are below background (1.51 mg/kg), the MTCA 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent cleanup levels.		Because all values are below background (0.81 mg/kg), the MTCA 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent cleanup levels.		Because all values are below background (15.7 mg/kg), the MTCA 3-part test is not required.	

Duplicate Analysis

Results:

Sampling Area	HEIS Number	Sample Date	Arsenic mg/kg	Arsenic Q	Arsenic PQL	Barium mg/kg	Barium Q	Barium PQL	Beryllium mg/kg	Beryllium Q	Beryllium PQL	Boron mg/kg	Boron Q	Boron PQL	Cadmium mg/kg	Cadmium Q	Cadmium PQL	Chromium mg/kg	Chromium Q	Chromium PQL	Cobalt mg/kg	Cobalt Q	Cobalt PQL
15	J030R7	4/15/05	2.7E+00	0	1.8E+00	8.19E+01		1.3E-01	4.5E-01		6.E-02	1.6E+00	UJ	1.6E+00	3.6E-01		2.5E-01	5.8E+00		2.5E-01	1.09E+01	0	4.4E-01
Duplicate of J030R7	J030R8	4/15/05	2.8E+00	###	1.7E+00	8.90E+01		1.2E-01	5.0E-01		6.E-02	1.8E+00		1.0E+00	2.5E-01		2.4E-01	5.5E+00		2.4E-01	1.16E+01	0	4.2E-01

Analysis:

		Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt
(TDL)		10	2	0.5	2	0.2	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)		No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD		8.3%				5.3%	6.2%

BG = background
GW = groundwater
HEIS = Hanford Environmental Information System
J = estimated
MTCA = *Model Toxic Control Act*
NA = not applicable
PQL = practical quantitation limit
Q = qualifier

RAG = remedial action goal
RESRAD = RESidual RADioactivity
RPD = relative percent difference
TDL = target detection limit
U = undetected
WAC = *Washington Administrative Code*

Shallow Zone Sample Data

Sampling Area	HEIS Number	Sample Date	Copper mg/kg	Copper Q	Copper PQL	Lead mg/kg	Lead Q	Lead PQL	Manganese mg/kg	Manganese Q	Manganese PQL	Nickel mg/kg	Nickel Q	Nickel PQL	Vanadium mg/kg	Vanadium Q	Vanadium PQL	Zinc mg/kg	Zinc Q	Zinc PQL
1	J030P3	4/15/05	2.51E+01		3.3E-01	8.3E+00		1.2E+00	5.34E+02		1.3E-01	1.79E+01		6.6E-01	5.92E+01		3.9E-01	6.67E+01		3.3E-01
2	J030P4	4/15/05	1.63E+01		2.5E-01	2.0E+00		9.4E-01	3.40E+02		1.E-01	7.9E+00		5.0E-01	5.94E+01		3.0E-01	4.85E+01		2.5E-01
3	J030P5	4/15/05	2.08E+01		2.8E-01	6.1E+00		1.0E+00	4.39E+02		1.1E-01	1.28E+01		5.5E-01	6.85E+01		3.3E-01	5.81E+01		2.8E-01
4	J030P6	4/15/05	2.63E+01		3.2E-01	9.1E+00		1.2E+00	5.50E+02		1.3E-01	1.92E+01		6.3E-01	6.73E+01		3.8E-01	7.18E+01		3.2E-01
5	J030P7	4/15/05	1.94E+01		2.8E-01	6.5E+00		1.1E+00	4.00E+02		1.1E-01	1.38E+01		5.6E-01	6.45E+01		3.4E-01	5.51E+01		2.8E-01
6	J030P8	4/15/05	1.87E+01		2.3E-01	3.9E+00		8.8E-01	3.46E+02		9.E-02	8.6E+00		4.6E-01	6.43E+01		2.8E-01	5.05E+01		2.3E-01
7	J030P9	4/15/05	1.58E+01		2.7E-01	2.3E+00		1.0E+00	3.50E+02		1.1E-01	8.2E+00		5.4E-01	6.36E+01		3.2E-01	4.75E+01		2.7E-01
8	J030R0	4/15/05	2.27E+01		2.7E-01	4.4E+00		1.0E+00	3.60E+02		1.1E-01	1.54E+01		5.4E-01	6.61E+01		3.2E-01	5.28E+01		2.7E-01
9	J030R1	4/15/05	2.09E+01		2.9E-01	4.5E+00		1.1E+00	4.00E+02		1.2E-01	1.12E+01		5.8E-01	6.82E+01		3.5E-01	5.84E+01		2.9E-01
10	J030R2	4/15/05	1.90E+01		2.9E-01	4.6E+00		1.1E+00	3.74E+02		1.2E-01	1.18E+01		5.9E-01	6.14E+01		3.5E-01	5.05E+01		2.9E-01
11	J030R3	4/15/05	1.94E+01		2.8E-01	5.8E+00		1.0E+00	3.92E+02		1.1E-01	1.26E+01		5.5E-01	6.54E+01		3.3E-01	5.48E+01		2.8E-01
12	J030R4	4/15/05	3.60E+01		3.1E-01	1.81E+01		1.2E+00	6.89E+02		1.2E-01	2.62E+01		6.1E-01	6.24E+01		3.7E-01	8.44E+01		3.1E-01
13	J030R5	4/15/05	2.05E+01		2.8E-01	5.7E+00		1.0E+00	4.34E+02		1.1E-01	1.39E+01		5.5E-01	7.39E+01		3.3E-01	5.90E+01		2.8E-01
14	J030R6	4/15/05	1.70E+01		2.8E-01	5.7E+00		1.1E+00	4.09E+02		1.1E-01	1.21E+01		5.7E-01	5.67E+01		3.4E-01	4.78E+01		2.8E-01
15	J030R7	4/15/05	1.99E+01		3.1E-01	4.6E+00		1.2E+00	3.56E+02		1.3E-01	9.3E+00		6.3E-01	6.48E+01		3.8E-01	5.25E+01		3.1E-01
Duplicate of J030R7	J030R8	4/15/05	2.10E+01		3.0E-01	5.2E+00		1.1E+00	3.85E+02		1.2E-01	1.01E+01		6.0E-01	7.61E+01		3.6E-01	6.93E+01		3.0E-01

Statistical Computation Input Data

Sampling Area	HEIS Number	Sample Date	Copper mg/kg	Lead mg/kg	Manganese mg/kg	Nickel mg/kg	Vanadium mg/kg	Zinc mg/kg
1	J030P3	4/15/05	2.51E+01	8.3E+00	5.34E+02	1.79E+01	5.92E+01	6.67E+01
2	J030P4	4/15/05	1.63E+01	2.0E+00	3.40E+02	7.9E+00	5.94E+01	4.85E+01
3	J030P5	4/15/05	2.08E+01	6.1E+00	4.39E+02	1.28E+01	6.85E+01	5.81E+01
4	J030P6	4/15/05	2.63E+01	9.1E+00	5.50E+02	1.92E+01	6.73E+01	7.18E+01
5	J030P7	4/15/05	1.94E+01	6.5E+00	4.00E+02	1.38E+01	6.45E+01	5.51E+01
6	J030P8	4/15/05	1.87E+01	3.9E+00	3.46E+02	8.6E+00	6.43E+01	5.05E+01
7	J030P9	4/15/05	1.58E+01	2.3E+00	3.50E+02	8.2E+00	6.36E+01	4.75E+01
8	J030R0	4/15/05	2.27E+01	4.4E+00	3.60E+02	1.54E+01	6.61E+01	5.28E+01
9	J030R1	4/15/05	2.09E+01	4.5E+00	4.00E+02	1.12E+01	6.82E+01	5.84E+01
10	J030R2	4/15/05	1.90E+01	4.6E+00	3.74E+02	1.18E+01	6.14E+01	5.05E+01
11	J030R3	4/15/05	1.94E+01	5.8E+00	3.92E+02	1.26E+01	6.54E+01	5.48E+01
12	J030R4	4/15/05	3.60E+01	1.81E+01	6.89E+02	2.62E+01	6.24E+01	8.44E+01
13	J030R5	4/15/05	2.05E+01	5.7E+00	4.34E+02	1.39E+01	7.39E+01	5.90E+01
14	J030R6	4/15/05	1.70E+01	5.7E+00	4.09E+02	1.21E+01	5.67E+01	4.78E+01
15	J030R7/J030R8	4/15/05	2.05E+01	4.9E+00	3.71E+02	9.7E+00	7.05E+01	6.09E+01

Statistical Computations

	Copper	Lead	Manganese	Nickel	Vanadium	Zinc
Statistical value based on	Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	15	15	15	15	15	15
% < Detection limit	0%	0%	0%	0%	0%	0%
mean	2.12E+01	6.1E+00	4.26E+02	1.34E+01	6.48E+01	5.78E+01
standard deviation	5.02E+00	3.8E+00	9.60E+01	4.8E+00	4.58E+00	1.01E+01
95% UCL on mean	2.34E+01	8.3E+00	4.67E+02	1.59E+01	6.69E+01	6.24E+01
maximum value	3.60E+01	1.81E+01	6.89E+02	2.62E+01	7.61E+01	8.44E+01
Statistical value	2.34E+01	8.3E+00	4.67E+02	1.59E+01	6.69E+01	6.24E+01
Background	NA	NA	NA	NA	NA	NA
Statistical value above background	2.34E+01	8.3E+00	4.67E+02	1.59E+01	6.69E+01	6.24E+01
Most Stringent Cleanup Limit for nonradionuclide and RAG type	22 BG/River Protection	10.2 BG/GW & River Protection	512 BG/GW Protection	19.1 BG/GW Protection	85.1 BG/GW Protection	67.8 BG/River Protection
WAC 173-340 3-PART TEST						
95% UCL > Cleanup Limit?	YES	NO	NO	NO	NA	NO
> 10% above Cleanup Limit?	YES	NO	YES	YES	NA	YES
Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NA	NO
WAC 173-340 Compliance? NO	Because of "yes" answers to the MTCA 3-part test, a detailed assessment using RESRAD will be performed. The data set meets the 3-part test criteria when compared to direct exposure cleanup levels.	The data set meets the 3-part test criteria when compared to the most stringent cleanup levels.	Because of "yes" answer to the MTCA 3-part test, a detailed assessment using RESRAD will be performed. The data set meets the 3-part test criteria when compared to direct exposure cleanup levels.	Because of "yes" answer to the MTCA 3-part test, a detailed assessment using RESRAD will be performed. The data set meets the 3-part test criteria when compared to direct exposure cleanup levels.	Because all values are below background (85.1 mg/kg), the MTCA 3-part test is not required.	Because of "yes" answer to the MTCA 3-part test, a detailed assessment using RESRAD will be performed. The data set meets the 3-part test criteria when compared to direct exposure cleanup levels.

Duplicate Analysis

Results:

Sampling Area	HEIS Number	Sample Date	Copper mg/kg	Copper Q	Copper PQL	Lead mg/kg	Lead Q	Lead PQL	Manganese mg/kg	Manganese Q	Manganese PQL	Nickel mg/kg	Nickel Q	Nickel PQL	Vanadium mg/kg	Vanadium Q	Vanadium PQL	Zinc mg/kg	Zinc Q	Zinc PQL
15	J030R7	4/15/05	1.99E+01	0	3.1E-01	4.6E+00		1.2E+00	3.56E+02		1.3E-01	9.3E+00		6.3E-01	6.48E+01		3.8E-01	5.25E+01		3.1E-01
Duplicate of J030R7	J030R8	4/15/05	2.10E+01	###	3.0E-01	5.2E+00		1.1E+00	3.85E+02		1.2E-01	1.01E+01		6.0E-01	7.61E+01		3.6E-01	6.93E+01		3.0E-01

Analysis:

		Copper	Lead	Manganese	Nickel	Vanadium	Zinc
	(TDL)	1	5	5	4	2.5	1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD	5.4%		7.8%		16%	28%

BG = background
GW = groundwater
HEIS = Hanford Environmental Information System
MTCA = *Model Toxic Control Act*
NA = not applicable
PQL = practical quantitation limit
Q = qualifier
RAG = remedial action goal
RESRAD = RESidual RADioactivity
RPD = relative percent difference
TDL = target detection limit
WAC = *Washington Administrative Code*

Bechtel Hanford, Inc.

CALCULATION SHEET

Originator J. M. Capron *JMC* Date 08/23/05 Calc. No. 0100B-CA-V0260 Rev. No. 0

Project 100 B/C Remedial Action Project Job No. 22192 Checked T. M. Blakley *TMB* Date *8/23/05*

Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations Checked T. B. Miley *TBM* Date *8-24-05*

Ecology Software (MTCAStat)

Arsenic 95% UCL Calculation

DATA	ID
5.1E+00	J030P3
1.5E+00	J030P4
3.0E+00	J030P5
6.2E+00	J030P6
2.7E+00	J030P7
4.1E+00	J030P8
4.0E+00	J030P9
8.1E+00	J030R0
4.4E+00	J030R1
4.1E+00	J030R2
2.0E+00	J030R3
1.20E+01	J030R4
3.1E+00	J030R5
2.3E+00	J030R6
2.8E+00	J030R7/J030R8

Number of samples		Uncensored values	
Uncensored	15	Mean	4.4
Censored		Lognormal mean	4.4
Detection limit or PQL		Std. devn.	2.7
Method detection limit		Median	4.0
TOTAL	15	Min.	1.5
		Max.	12.0

Lognormal distribution? r-squared is: 0.974

Normal distribution? r-squared is: 0.808

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 5.9

Barium 95% UCL Calculation

DATA	ID
8.75E+01	J030P3
5.93E+01	J030P4
7.09E+01	J030P5
1.30E+02	J030P6
7.51E+01	J030P7
5.49E+01	J030P8
5.71E+01	J030P9
6.79E+01	J030R0
9.09E+01	J030R1
7.11E+01	J030R2
7.21E+01	J030R3
1.63E+02	J030R4
6.39E+01	J030R5
6.50E+01	J030R6
8.55E+01	J030R7/J030R8

Number of samples		Uncensored values	
Uncensored	15	Mean	80.9
Censored		Lognormal mean	80.8
Detection limit or PQL		Std. devn.	29.3
Method detection limit		Median	71.1
TOTAL	15	Min.	54.9
		Max.	163

Lognormal distribution? r-squared is: 0.861

Normal distribution? r-squared is: 0.746

Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 93.4

Beryllium 95% UCL Calculation

DATA	ID
4.9E-01	J030P3
3.1E-01	J030P4
4.6E-01	J030P5
5.8E-01	J030P6
4.3E-01	J030P7
4.7E-01	J030P8
5.1E-01	J030P9
5.4E-01	J030R0
6.1E-01	J030R1
5.6E-01	J030R2
4.5E-01	J030R3
7.6E-01	J030R4
4.9E-01	J030R5
3.4E-01	J030R6
4.8E-01	J030R7/J030R8

Number of samples		Uncensored values	
Uncensored	15	Mean	0.50
Censored		Lognormal mean	0.50
Detection limit or PQL		Std. devn.	0.11
Method detection limit		Median	0.49
TOTAL	15	Min.	0.31
		Max.	0.76

Lognormal distribution? r-squared is: 0.942

Normal distribution? r-squared is: 0.932

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.56

Boron 95% UCL Calculation

DATA	ID
5.4E+00	J030P3
7.5E-01	J030P4
2.1E+00	J030P5
4.2E+00	J030P6
7.8E+00	J030P7
4.5E+00	J030P8
3.6E+00	J030P9
3.8E+00	J030R0
5.2E+00	J030R1
4.2E+00	J030R2
3.7E+00	J030R3
5.5E+00	J030R4
6.3E+00	J030R5
3.3E+00	J030R6
1.3E+00	J030R7/J030R8

Number of samples		Uncensored values	
Uncensored	15	Mean	4.1
Censored		Lognormal mean	4.3
Detection limit or PQL		Std. devn.	1.8
Method detection limit		Median	4.2
TOTAL	15	Min.	0.8
		Max.	7.8

Lognormal distribution? r-squared is: 0.849

Normal distribution? r-squared is: 0.973

Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 4.9

Bechtel Hanford, Inc.

CALCULATION SHEET

Originator J. M. Capron *JMC*	Date 08/23/05	Calc. No. 0100B-CA-V0260	Rev. No. 0
Project 100 B/C Remedial Action Project	Job No. 22192	Checked T. M. Blakley *TMB*	Date *8/23/05*
Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations		Checked T. B. Miley *TBM*	Date *8-29-05*
			Sheet No. 6 of 8

Ecology Software (MTCAStat)

Cadmium 95% UCL Calculation

DATA	ID
4.1E-01	J030P3
1.0E-01	J030P4
3.3E-01	J030P5
3.7E-01	J030P6
3.4E-01	J030P7
9.0E-02	J030P8
1.1E-01	J030P9
1.1E-01	J030R0
1.2E-01	J030R1
1.2E-01	J030R2
2.5E-01	J030R3
3.9E-01	J030R4
2.9E-01	J030R5
4.2E-01	J030R6
3.1E-01	J030R7/J030R8

Number of samples		Uncensored values	
Uncensored	15	Mean	0.25
Censored		Lognormal mean	0.26
Detection limit or PQL		Std. devn.	0.13
Method detection limit		Median	0.29
TOTAL	15	Min.	0.090
		Max.	0.42

Lognormal distribution? r-squared is: 0.839

Normal distribution? r-squared is: 0.874

Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 0.30

Chromium 95% UCL Calculation

DATA	ID
1.55E+01	J030P3
4.9E+00	J030P4
9.8E+00	J030P5
1.56E+01	J030P6
1.10E+01	J030P7
5.0E+00	J030P8
4.1E+00	J030P9
5.5E+00	J030R0
6.6E+00	J030R1
8.8E+00	J030R2
1.01E+01	J030R3
2.07E+01	J030R4
8.7E+00	J030R5
8.6E+00	J030R6
5.7E+00	J030R7/J030R8

Number of samples		Uncensored values	
Uncensored	15	Mean	9.4
Censored		Lognormal mean	9.4
Detection limit or PQL		Std. devn.	4.7
Method detection limit		Median	8.7
TOTAL	15	Min.	4.1
		Max.	20.7

Lognormal distribution? r-squared is: 0.966

Normal distribution? r-squared is: 0.885

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 12.2

Cobalt 95% UCL Calculation

DATA	ID
1.18E+01	J030P3
9.1E+00	J030P4
1.06E+01	J030P5
1.28E+01	J030P6
1.00E+01	J030P7
1.01E+01	J030P8
1.02E+01	J030P9
1.10E+01	J030R0
1.12E+01	J030R1
9.9E+00	J030R2
9.9E+00	J030R3
1.56E+01	J030R4
1.09E+01	J030R5
8.9E+00	J030R6
1.13E+01	J030R7/J030R8

Number of samples		Uncensored values	
Uncensored	15	Mean	10.9
Censored		Lognormal mean	10.9
Detection limit or PQL		Std. devn.	1.6
Method detection limit		Median	10.6
TOTAL	15	Min.	8.9
		Max.	15.6

Lognormal distribution? r-squared is: 0.891

Normal distribution? r-squared is: 0.829

Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 11.6

Copper 95% UCL Calculation

DATA	ID
2.51E+01	J030P3
1.63E+01	J030P4
2.08E+01	J030P5
2.63E+01	J030P6
1.94E+01	J030P7
1.87E+01	J030P8
1.58E+01	J030P9
2.27E+01	J030R0
2.09E+01	J030R1
1.90E+01	J030R2
1.94E+01	J030R3
3.60E+01	J030R4
2.05E+01	J030R5
1.70E+01	J030R6
2.05E+01	J030R7/J030R8

Number of samples		Uncensored values	
Uncensored	15	Mean	21.2
Censored		Lognormal mean	21.2
Detection limit or PQL		Std. devn.	5.02
Method detection limit		Median	20.5
TOTAL	15	Min.	15.8
		Max.	36.0

Lognormal distribution? r-squared is: 0.887

Normal distribution? r-squared is: 0.793

Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 23.4

Bechtel Hanford, Inc.

CALCULATION SHEET

Originator J. M. Capron JMC	Date 08/23/05	Calc. No. 0100B-CA-V0260	Rev. No. 0
Project 100 B/C Remedial Action Project	Job No. 22192	Checked T. M. Blakley TMB	Date 8/23/05
Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations		Checked T. B. Miley TBM	Date 8-24-05
			Sheet No. 7 of 8

Ecology Software (MTCAStat)

Lead 95% UCL Calculation

DATA	ID
8.3E+00	J030P3
2.0E+00	J030P4
6.1E+00	J030P5
9.1E+00	J030P6
6.5E+00	J030P7
3.9E+00	J030P8
2.3E+00	J030P9
4.4E+00	J030R0
4.5E+00	J030R1
4.6E+00	J030R2
5.8E+00	J030R3
1.81E+01	J030R4
5.7E+00	J030R5
5.7E+00	J030R6
4.9E+00	J030R7/J030R8

Number of samples		Uncensored values	
Uncensored	15	Mean	6.1
Censored		Lognormal mean	6.1
Detection limit or PQL		Std. devn.	3.8
Method detection limit		Median	5.7
TOTAL	15	Min.	2.0
		Max.	18.1

Lognormal distribution? r-squared is: 0.925

Normal distribution? r-squared is: 0.727

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 8.3

Manganese 95% UCL Calculation

DATA	ID
5.34E+02	J030P3
3.40E+02	J030P4
4.39E+02	J030P5
5.50E+02	J030P6
4.00E+02	J030P7
3.46E+02	J030P8
3.50E+02	J030P9
3.60E+02	J030R0
4.00E+02	J030R1
3.74E+02	J030R2
3.92E+02	J030R3
6.89E+02	J030R4
4.34E+02	J030R5
4.09E+02	J030R6
3.71E+02	J030R7/J030R8

Number of samples		Uncensored values	
Uncensored	15	Mean	426
Censored		Lognormal mean	426
Detection limit or PQL		Std. devn.	96.0
Method detection limit		Median	400
TOTAL	15	Min.	340
		Max.	689

Lognormal distribution? r-squared is: 0.853

Normal distribution? r-squared is: 0.785

Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 467

Nickel 95% UCL Calculation

DATA	ID
1.79E+01	J030P3
7.9E+00	J030P4
1.28E+01	J030P5
1.92E+01	J030P6
1.38E+01	J030P7
8.6E+00	J030P8
8.2E+00	J030P9
1.54E+01	J030R0
1.12E+01	J030R1
1.18E+01	J030R2
1.26E+01	J030R3
2.62E+01	J030R4
1.39E+01	J030R5
1.21E+01	J030R6
9.7E+00	J030R7/J030R8

Number of samples		Uncensored values	
Uncensored	15	Mean	13.4
Censored		Lognormal mean	13.4
Detection limit or PQL		Std. devn.	4.8
Method detection limit		Median	12.6
TOTAL	15	Min.	7.9
		Max.	26.2

Lognormal distribution? r-squared is: 0.964

Normal distribution? r-squared is: 0.881

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 15.9

Vanadium 95% UCL Calculation

DATA	ID
5.92E+01	J030P3
5.94E+01	J030P4
6.85E+01	J030P5
6.73E+01	J030P6
6.45E+01	J030P7
6.43E+01	J030P8
6.36E+01	J030P9
6.61E+01	J030R0
6.82E+01	J030R1
6.14E+01	J030R2
6.54E+01	J030R3
6.24E+01	J030R4
7.39E+01	J030R5
5.67E+01	J030R6
7.05E+01	J030R7/J030R8

Number of samples		Uncensored values	
Uncensored	15	Mean	64.8
Censored		Lognormal mean	64.8
Detection limit or PQL		Std. devn.	4.58
Method detection limit		Median	64.5
TOTAL	15	Min.	56.7
		Max.	73.9

Lognormal distribution? r-squared is: 0.992

Normal distribution? r-squared is: 0.991

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 66.9

Bechtel Hanford, Inc.

HANFORD

CALCULATION SHEET

Originator J. M. Capron *JMC* Date 08/23/05 Calc. No. 0100B-CA-V0260 Rev. No. 0

Project 100 B/C Remedial Action Project Job No. 22192 Checked T. M. Blakley *TMB* Date *8/23/05*

Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations Checked T. B. Miley *TBM* Date *8-24-05*

Ecology Software (MTCAStat)

	DATA	ID					
1			Zinc 95% UCL Calculation				
2	6.67E+01	J030P3					
3	4.85E+01	J030P4					
4	5.81E+01	J030P5	Number of samples			Uncensored values	
5	7.18E+01	J030P6	Uncensored	15		Mean	57.8
6	5.51E+01	J030P7	Censored			Lognormal mean	57.8
7	5.05E+01	J030P8	Detection limit or PQL			Std. devn.	10.1
8	4.75E+01	J030P9	Method detection limit			Median	55.1
9	5.28E+01	J030R0	TOTAL	15		Min.	47.5
10	5.84E+01	J030R1				Max.	84.4
11	5.05E+01	J030R2					
12	5.48E+01	J030R3	Lognormal distribution?			Normal distribution?	
13	8.44E+01	J030R4	r-squared is: 0.911			r-squared is:	0.860
14	5.90E+01	J030R5	Recommendations:				
15	4.78E+01	J030R6	Use lognormal distribution.				
16	6.09E+01	J030R7/J030R8					
17			UCL (Land's method) is	62.4			
18							
19							
20							

Attachment 1. 126-B-3 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Antimony			Arsenic			Barium			Beryllium			Boron			Cadmium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
1	J030P3	04/15/05	1.4	UJ	1.4	5.1		1.9	87.5		0.13	0.49		0.07	5.4		1.1	0.41		0.26
2	J030P4	04/15/05	1.1	UJ	1.1	1.5		1.4	59.3		0.1	0.31		0.05	1.5	UJ	1.5	0.20	U	0.20
3	J030P5	04/15/05	1.2	UJ	1.2	3.0		1.6	70.9		0.11	0.46		0.06	2.1		0.94	0.33		0.22
4	J030P6	04/15/05	1.4	UJ	1.4	6.2		1.8	130		0.13	0.58		0.06	4.2		1.1	0.37		0.25
5	J030P7	04/15/05	1.2	UJ	1.2	2.7		1.6	75.1		0.11	0.43		0.06	7.8		0.95	0.34		0.22
6	J030P8	04/15/05	1.0	UJ	1.0	4.1		1.3	54.9		0.09	0.47		0.05	4.5		0.78	0.18	U	0.18
7	J030P9	04/15/05	1.2	UJ	1.2	4.0		1.6	57.1		0.11	0.51		0.05	3.6		0.91	0.21	U	0.21
8	J030R0	04/15/05	1.2	UJ	1.2	8.1		1.6	67.9		0.11	0.54		0.05	3.8		0.92	0.22	U	0.22
9	J030R1	04/15/05	1.3	UJ	1.3	4.4		1.7	90.9		0.12	0.61		0.06	5.2		0.98	0.23	U	0.23
10	J030R2	04/15/05	1.3	UJ	1.3	4.1		1.7	71.1		0.12	0.56		0.06	4.2		1.0	0.23	U	0.23
11	J030R3	04/15/05	1.2	UJ	1.2	2.0		1.6	72.1		0.11	0.45		0.06	3.7		0.94	0.25		0.22
12	J030R4	04/15/05	1.3	UJ	1.3	12.0		1.8	163		0.12	0.76		0.06	5.5		1.0	0.39		0.24
13	J030R5	04/15/05	1.2	UJ	1.2	3.1		1.6	63.9		0.11	0.49		0.06	6.3		0.94	0.29		0.22
14	J030R6	04/15/05	1.2	UJ	1.3	2.3		1.6	65.0		0.11	0.34		0.06	3.3		0.96	0.42		0.23
15	J030R7	04/15/05	1.4	UJ	1.4	2.7		1.8	81.9		0.13	0.45		0.06	1.6	UJ	1.6	0.36		0.25
Duplicate of J030R7	J030R8	04/15/05	1.3	UJ	1.3	2.8		1.7	89.0		0.12	0.50		0.06	1.8		1.0	0.25		0.24
Equipment Blank	J030R9	04/15/05	0.19	UJ	0.19	0.25	U	0.25	1.7		0.02	0.04	UJ	0.04	0.15	U	0.15	0.03	U	0.03

Note: Data qualified with B, C, and/or J, are considered acceptable values.
B = blank contamination
BHC = hexachlorocyclohexane
D = diluted
HEIS = Hanford Environmental Information System
J = estimate
PCB = polychlorinated biphenyl
PQL = practical quantitation limit
Q = qualifier
SVOA = semivolatile organic analyte
U = undetected

Attachment	1	Sheet No.	1 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	8/23/05
Checked	T. M. Blakley	Date	8-24-05
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Chromium			Cobalt			Copper			Lead			Manganese			Mercury		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
1	J030P3	04/15/05	15.5		0.26	11.8		0.46	25.1		0.33	8.3		1.2	534		0.13	0.02	U	0.02
2	J030P4	04/15/05	4.9		0.20	9.1		0.35	16.3		0.25	2.0		0.94	340		0.1	0.03		0.01
3	J030P5	04/15/05	9.8		0.22	10.6		0.39	20.8		0.28	6.1		1.0	439		0.11	0.02	U	0.02
4	J030P6	04/15/05	15.6		0.25	12.8		0.44	26.3		0.32	9.1		1.2	550		0.13	0.02	U	0.02
5	J030P7	04/15/05	11.0		0.22	10.0		0.39	19.4		0.28	6.5		1.1	400		0.11	0.02	U	0.02
6	J030P8	04/15/05	5.0		0.18	10.1		0.32	18.7		0.23	3.9		0.88	346		0.09	0.01	U	0.01
7	J030P9	04/15/05	4.1		0.21	10.2		0.38	15.8		0.27	2.3		1.0	350		0.11	0.02	U	0.02
8	J030R0	04/15/05	5.5		0.22	11.0		0.38	22.7		0.27	4.4		1.0	360		0.11	0.02	U	0.02
9	J030R1	04/15/05	6.6		0.23	11.2		0.40	20.9		0.29	4.5		1.1	400		0.12	0.02	U	0.02
10	J030R2	04/15/05	8.8		0.23	9.9		0.41	19.0		0.29	4.6		1.1	374		0.12	0.02	U	0.02
11	J030R3	04/15/05	10.1		0.22	9.9		0.39	19.4		0.28	5.8		1.0	392		0.11	0.02	U	0.02
12	J030R4	04/15/05	20.7		0.24	15.6		0.43	36.0		0.31	18.1		1.2	689		0.12	0.03		0.02
13	J030R5	04/15/05	8.7		0.22	10.9		0.39	20.5		0.28	5.7		1.0	434		0.11	0.02	U	0.02
14	J030R6	04/15/05	8.6		0.23	8.9		0.40	17.0		0.28	5.7		1.1	409		0.11	0.01	U	0.01
15	J030R7	04/15/05	5.8		0.25	10.9		0.44	19.9		0.31	4.6		1.2	356		0.13	0.02	U	0.02
Duplicate of J030R7	J030R8	04/15/05	5.5		0.24	11.6		0.42	21.0		0.30	5.2		1.1	385		0.12	0.01	U	0.01
Equipment Blank	J030R9	04/15/05	0.11		0.03	0.13		0.06	0.24		0.04	0.51		0.17	12.9		0.02	0.01	U	0.01

Attachment 1. 126-B-3 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Molybdenum			Nickel			Selenium			Silver			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
1	J030P3	04/15/05	1.1	U	1.1	17.9		0.66	2.6	U	2.6	0.33	U	0.33	59.2		0.39	66.7		0.33
2	J030P4	04/15/05	1.4		0.84	7.9		0.50	2.0	U	2.0	0.25	U	0.25	59.4		0.30	48.5		0.25
3	J030P5	04/15/05	0.94	U	0.94	12.8		0.55	2.2	U	2.2	0.28	U	0.28	68.5		0.33	58.1		0.28
4	J030P6	04/15/05	1.1	U	1.1	19.2		0.63	2.5	U	2.5	0.32	U	0.32	67.3		0.38	71.8		0.32
5	J030P7	04/15/05	0.95	U	0.95	13.8		0.56	2.2	U	2.2	0.28	U	0.28	64.5		0.34	55.1		0.28
6	J030P8	04/15/05	0.83		0.78	8.6		0.46	1.8	U	1.8	0.23	U	0.23	64.3		0.28	50.5		0.23
7	J030P9	04/15/05	0.91	U	0.91	8.2		0.54	2.1	U	2.1	0.27	U	0.27	63.6		0.32	47.5		0.27
8	J030R0	04/15/05	0.92	U	0.92	15.4		0.54	2.2	U	2.2	0.27	U	0.27	66.1		0.32	52.8		0.27
9	J030R1	04/15/05	0.98	U	0.98	11.2		0.58	2.3	U	2.3	0.29	U	0.29	68.2		0.35	58.4		0.29
10	J030R2	04/15/05	1.0	U	1.0	11.8		0.59	2.3	U	2.3	0.29	U	0.29	61.4		0.35	50.5		0.29
11	J030R3	04/15/05	0.94	U	0.94	12.6		0.55	2.2	U	2.2	0.28	U	0.28	65.4		0.33	54.8		0.28
12	J030R4	04/15/05	1.2		1.0	26.2		0.61	2.4	U	2.4	0.31	U	0.31	62.4		0.37	84.4		0.31
13	J030R5	04/15/05	1.1		0.94	13.9		0.55	2.2	U	2.2	0.28	U	0.28	73.9		0.33	59.0		0.28
14	J030R6	04/15/05	0.96	U	0.96	12.1		0.57	2.3	U	2.3	0.28	U	0.28	56.7		0.34	47.8		0.28
15	J030R7	04/15/05	1.1	U	1.1	9.3		0.63	2.5	U	2.5	0.31	U	0.31	64.8		0.38	52.5		0.31
Duplicate of J030R7	J030R8	04/15/05	1.0	U	1.0	10.1		0.60	2.4	U	2.4	0.30	U	0.30	76.1		0.36	69.3		0.30
Equipment Blank	J030R9	04/15/05	0.15	U	0.15	0.11		0.09	0.35	U	0.35	0.04	U	0.04	0.30		0.05	2.6		0.04

Sample Location	HEIS Number	Sample Date	Total Petroleum Hydrocarbon			HEIS Number	Asbestos
			mg/kg	Q	PQL		
1	J030P3	04/15/05	150	U	150	J030T0	None Detected
2	J030P4	04/15/05	137	U	137	J030T1	None Detected
3	J030P5	04/15/05	141	U	141	J030T2	None Detected
4	J030P6	04/15/05	144	U	144	J030T3	None Detected
5	J030P7	04/15/05	140	U	140	J030T4	None Detected
6	J030P8	04/15/05	137	U	137	J030T5	None Detected
7	J030P9	04/15/05	138	U	138	J030T6	None Detected
8	J030R0	04/15/05	137	U	137	J030T7	None Detected
9	J030R1	04/15/05	136	U	136	J030T8	None Detected
10	J030R2	04/15/05	139	U	139	J030T9	None Detected
11	J030R3	04/15/05	139	U	139	J030V0	None Detected
12	J030R4	04/15/05	142	U	142	J030V1	None Detected
13	J030R5	04/15/05	137	U	137	J030V2	None Detected
14	J030R6	04/15/05	138	U	138	J030V3	None Detected
15	J030R7	04/15/05	138	U	138	J030V4	None Detected
Duplicate of J030R7	J030R8	04/15/05	139	U	139	J030V5	None Detected
Equipment Blank	J030R9	04/15/05	133	U	133	Not Applicable	Not Applicable

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030P3 Location 1 Sample Date 04/15/05			J030P4 Location 2 Sample Date 04/15/05			J030P5 Location 3 Sample Date 04/15/05			J030P6 Location 4 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Biphenyls (PCBs)												
Aroclor-1016	15	U	15	14	U	14	14	U	14	14	U	14
Aroclor-1221	15	U	15	14	U	14	14	U	14	14	U	14
Aroclor-1232	15	U	15	14	U	14	14	U	14	14	U	14
Aroclor-1242	15	U	15	14	U	14	14	U	14	14	U	14
Aroclor-1248	15	U	15	14	U	14	14	U	14	14	U	14
Aroclor-1254	15	U	15	14	U	14	14	U	14	14	U	14
Aroclor-1260	15	U	15	14	U	14	14	U	14	17		14
Pesticides												
Aldrin	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Alpha-BHC	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
alpha-Chlordane	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Hexachlorocyclohexane	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Delta-BHC	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Dichlorodiphenyldichloroethane	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Dichlorodiphenyldichloroethylene	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Dichlorodiphenyltrichloroethane	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Dieldrin	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Endosulfan I	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Endosulfan II	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Endosulfan sulfate	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Endrin	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Endrin aldehyde	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Endrin ketone	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Gamma-BHC (Lindane)	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
gamma-Chlordane	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Heptachlor	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Heptachlor epoxide	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Methoxychlor	19	U	19	17	U	17	18	U	18	18	U	18
Toxaphene	190	UJ	190	170	UJ	170	180	UJ	180	180	UJ	180
Semivolatile Organics (SVOAs)												
1,2,4-Trichlorobenzene	380	U	380	340	U	340	350	U	350	360	U	360
1,2-Dichlorobenzene	380	U	380	340	U	340	350	U	350	360	U	360
1,3-Dichlorobenzene	380	U	380	340	U	340	350	U	350	360	U	360
1,4-Dichlorobenzene	380	U	380	340	U	340	350	U	350	360	U	360
2,4,5-Trichlorophenol	940	UJ	940	860	UJ	860	880	UJ	880	900	UJ	900
2,4,6-Trichlorophenol	380	UJ	380	340	UJ	340	350	UJ	350	360	UJ	360
2,4-Dichlorophenol	380	U	380	340	U	340	350	U	350	360	U	360
2,4-Dimethylphenol	380	U	380	340	U	340	350	U	350	360	U	360
2,4-Dinitrophenol	940	U	940	860	U	860	880	U	880	900	U	900
2,4-Dinitrotoluene	380	U	380	340	U	340	350	U	350	360	U	360
2,6-Dinitrotoluene	380	U	380	340	U	340	350	U	350	360	U	360
2-Chloronaphthalene	380	U	380	340	U	340	350	U	350	360	U	360
2-Chlorophenol	380	U	380	340	U	340	350	U	350	360	U	360
2-Methylnaphthalene	390		380	340	U	340	350	U	350	360	U	360
2-Methylphenol (cresol, o-)	380	U	380	340	U	340	350	U	350	360	U	360

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030P3 Location 1 Sample Date 04/15/05			J030P4 Location 2 Sample Date 04/15/05			J030P5 Location 3 Sample Date 04/15/05			J030P6 Location 4 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)												
2-Nitroaniline	940	U	940	860	U	860	880	U	880	900	U	900
2-Nitrophenol	380	U	380	340	U	340	350	U	350	360	U	360
3+4 Methylphenol (cresol, m+p)	380	U	380	340	U	340	350	U	350	360	U	360
3,3'-Dichlorobenzidine	380	U	380	340	U	340	350	U	350	360	U	360
3-Nitroaniline	940	U	940	860	U	860	880	U	880	900	U	900
4,6-Dinitro-2-methylphenol	940	U	940	860	U	860	880	U	880	900	U	900
4-Bromophenylphenyl ether	380	U	380	340	U	340	350	U	350	360	U	360
4-Chloro-3-methylphenol	380	U	380	340	U	340	350	U	350	360	U	360
4-Chloroaniline	380	U	380	340	U	340	350	U	350	360	U	360
4-Chlorophenylphenyl ether	380	U	380	340	U	340	350	U	350	360	U	360
4-Nitroaniline	940	U	940	860	U	860	880	U	880	900	U	900
4-Nitrophenol	940	U	940	860	U	860	880	U	880	900	U	900
Acenaphthene	380	U	380	340	U	340	350	U	350	360	U	360
Acenaphthylene	380	U	380	340	U	340	350	U	350	360	U	360
Anthracene	36	J	380	340	U	340	350	U	350	360	U	360
Benzo(a)anthracene	53	J	380	340	U	340	350	U	350	360	U	360
Benzo(a)pyrene	28	J	380	340	U	340	350	U	350	360	U	360
Benzo(b)fluoranthene	34	J	380	340	U	340	350	U	350	360	U	360
Benzo(ghi)perylene	26	J	380	340	U	340	350	U	350	360	U	360
Benzo(k)fluoranthene	21	J	380	340	U	340	350	U	350	360	U	360
Bis(2-chloro-1-methylethyl)ether	380	U	380	340	U	340	350	U	350	360	U	360
Bis(2-Chloroethoxy)methane	380	U	380	340	U	340	350	U	350	360	U	360
Bis(2-chloroethyl) ether	380	U	380	340	U	340	350	U	350	360	U	360
Bis(2-ethylhexyl) phthalate	660	U	660	660	U	660	660	U	660	660	U	660
Butylbenzylphthalate	380	U	380	340	U	340	350	U	350	360	U	360
Carbazole	380	U	380	340	U	340	350	U	350	360	U	360
Chrysene	84	J	380	340	U	340	350	U	350	360	U	360
Di-n-butylphthalate	660	U	660	340	UB	340	350	UB	350	660	U	660
Di-n-octylphthalate	380	U	380	340	U	340	350	U	350	360	U	360
Dibenz[a,h]anthracene	380	U	380	340	U	340	350	U	350	360	U	360
Dibenzofuran	99	J	380	340	U	340	350	U	350	360	U	360
Diethylphthalate	380	U	380	340	U	340	350	U	350	360	U	360
Dimethyl phthalate	380	U	380	340	U	340	350	U	350	360	U	360
Fluoranthene	120	J	380	340	U	340	350	U	350	360	U	360
Fluorene	380	U	380	340	U	340	350	U	350	360	U	360
Hexachlorobenzene	380	U	380	340	U	340	350	U	350	360	U	360
Hexachlorobutadiene	380	U	380	340	U	340	350	U	350	360	U	360
Hexachlorocyclopentadiene	380	U	380	340	U	340	350	U	350	360	U	360
Hexachloroethane	380	U	380	340	U	340	350	U	350	360	U	360
Indeno(1,2,3-cd)pyrene	24	J	380	340	U	340	350	U	350	360	U	360
Isophorone	380	U	380	340	U	340	350	U	350	360	U	360

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030P3 Location 1 Sample Date 04/15/05			J030P4 Location 2 Sample Date 04/15/05			J030P5 Location 3 Sample Date 04/15/05			J030P6 Location 4 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)												
N-Nitroso-di-n-dipropylamine	380	U	380	340	U	340	350	U	350	360	U	360
N-Nitrosodiphenylamine	100	J	380	340	U	340	350	U	350	360	U	360
Naphthalene	120	J	380	340	U	340	350	U	350	360	U	360
Nitrobenzene	380	U	380	340	U	340	350	U	350	360	U	360
Pentachlorophenol	940	UJ	940	860	UJ	860	880	UJ	880	900	UJ	900
Phenanthrene	200	J	380	340	U	340	350	U	350	360	U	360
Phenol	380	U	380	340	U	340	350	U	350	360	U	360
Pyrene	86	J	380	340	U	340	350	U	350	360	U	360

Constituent	J030P7 Location 5 Sample Date 04/15/05			J030P8 Location 6 Sample Date 04/15/05			J030P9 Location 7 Sample Date 04/15/05			J030R0 Location 8 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Biphenyls (PCBs)												
Aroclor-1016	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1221	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1232	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1242	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1248	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1254	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1260	14	U	14	14	U	14	14	U	14	14	U	14
Pesticides												
Aldrin	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Alpha-BHC	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
alpha-Chlordane	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Delta-BHC	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Dichlorodiphenyldichloroethane	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Dichlorodiphenyldichloroethylene	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Dichlorodiphenyltrichloroethane	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Dieldrin	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Endosulfan I	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Endosulfan II	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Endosulfan sulfate	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Endrin	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Endrin aldehyde	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Endrin ketone	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Gamma-BHC (Lindane)	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
gamma-Chlordane	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Heptachlor	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Heptachlor epoxide	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Methoxychlor	18	U	18	17	U	17	17	U	17	17	U	17
Toxaphene	180	UJ	180	170	UJ	170	170	UJ	170	170	UJ	170

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030P7 Location 5 Sample Date 04/15/05			J030P8 Location 6 Sample Date 04/15/05			J030P9 Location 7 Sample Date 04/15/05			J030R0 Location 8 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs												
1,2,4-Trichlorobenzene	350	U	350	350	U	350	350	U	350	340	U	340
1,2-Dichlorobenzene	350	U	350	350	U	350	350	U	350	340	U	340
1,3-Dichlorobenzene	350	U	350	350	U	350	350	U	350	340	U	340
1,4-Dichlorobenzene	350	U	350	350	U	350	350	U	350	340	U	340
2,4,5-Trichlorophenol	880	UJ	880	860	UJ	860	860	UJ	860	860	UJ	860
2,4,6-Trichlorophenol	350	UJ	350	350	UJ	350	350	UJ	350	340	UJ	340
2,4-Dichlorophenol	350	U	350	350	U	350	350	U	350	340	U	340
2,4-Dimethylphenol	350	U	350	350	U	350	350	U	350	340	U	340
2,4-Dinitrophenol	880	U	880	860	U	860	860	U	860	860	U	860
2,4-Dinitrotoluene	350	U	350	350	U	350	350	U	350	340	U	340
2,6-Dinitrotoluene	350	U	350	350	U	350	350	U	350	340	U	340
2-Chloronaphthalene	350	U	350	350	U	350	350	U	350	340	U	340
2-Chlorophenol	350	U	350	350	U	350	350	U	350	340	U	340
2-Methylnaphthalene	350	U	350	350	U	350	350	U	350	340	U	340
2-Methylphenol (cresol, o-)	350	U	350	350	U	350	350	U	350	340	U	340
2-Nitroaniline	880	U	880	860	U	860	860	U	860	860	U	860
2-Nitrophenol	350	U	350	350	U	350	350	U	350	340	U	340
3+4 Methylphenol (cresol, m+p)	350	U	350	350	U	350	350	U	350	340	U	340
3,3'-Dichlorobenzidine	350	U	350	350	U	350	350	U	350	340	U	340
3-Nitroaniline	880	U	880	860	U	860	860	U	860	860	U	860
4,6-Dinitro-2-methylphenol	880	U	880	860	U	860	860	U	860	860	U	860
4-Bromophenylphenyl ether	350	U	350	350	U	350	350	U	350	340	U	340
4-Chloro-3-methylphenol	350	U	350	350	U	350	350	U	350	340	U	340
4-Chloroaniline	350	U	350	350	U	350	350	U	350	340	U	340
4-Chlorophenylphenyl ether	350	U	350	350	U	350	350	U	350	340	U	340
4-Nitroaniline	880	U	880	860	U	860	860	U	860	860	U	860
4-Nitrophenol	880	U	880	860	U	860	860	U	860	860	U	860
Acenaphthene	350	U	350	350	U	350	350	U	350	340	U	340
Acenaphthylene	350	U	350	350	U	350	350	U	350	340	U	340
Anthracene	350	U	350	350	U	350	350	U	350	340	U	340
Benzo(a)anthracene	350	U	350	350	U	350	350	U	350	340	U	340
Benzo(a)pyrene	350	U	350	350	U	350	350	U	350	340	U	340
Benzo(b)fluoranthene	350	U	350	350	U	350	350	U	350	340	U	340
Benzo(ghi)perylene	350	U	350	350	U	350	350	U	350	340	U	340
Benzo(k)fluoranthene	350	U	350	350	U	350	350	U	350	340	U	340
Bis(2-chloro-1-methylethyl)ether	350	U	350	350	U	350	350	U	350	340	U	340
Bis(2-Chloroethoxy)methane	350	U	350	350	U	350	350	U	350	340	U	340
Bis(2-chloroethyl) ether	350	U	350	350	U	350	350	U	350	340	U	340
Bis(2-ethylhexyl) phthalate	660	U	660	660	U	660	660	U	660	660	U	660
Butylbenzylphthalate	350	U	350	350	U	350	350	U	350	340	U	340
Carbazole	350	U	350	350	U	350	350	U	350	340	U	340
Chrysene	350	U	350	350	U	350	350	U	350	340	U	340
Di-n-butylphthalate	660	U	660	660	U	660	350	UB	350	340	UB	340
Di-n-octylphthalate	350	U	350	350	U	350	350	U	350	340	U	340
Dibenz[a,h]anthracene	350	U	350	350	U	350	350	U	350	340	U	340
Dibenzofuran	350	U	350	350	U	350	350	U	350	340	U	340
Diethylphthalate	350	U	350	350	U	350	350	U	350	340	U	340
Dimethyl phthalate	350	U	350	350	U	350	350	U	350	340	U	340

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030P7 Location 5 Sample Date 04/15/05			J030P8 Location 6 Sample Date 04/15/05			J030P9 Location 7 Sample Date 04/15/05			J030R0 Location 8 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)												
Fluoranthene	350	U	350	350	U	350	350	U	350	340	U	340
Fluorene	350	U	350	350	U	350	350	U	350	340	U	340
Hexachlorobenzene	350	U	350	350	U	350	350	U	350	340	U	340
Hexachlorobutadiene	350	U	350	350	U	350	350	U	350	340	U	340
Hexachlorocyclopentadiene	350	U	350	350	U	350	350	U	350	340	U	340
Hexachloroethane	350	U	350	350	U	350	350	U	350	340	U	340
Indeno(1,2,3-cd)pyrene	350	U	350	350	U	350	350	U	350	340	U	340
Isophorone	350	U	350	350	U	350	350	U	350	340	U	340
N-Nitroso-di-n-dipropylamine	350	U	350	350	U	350	350	U	350	340	U	340
N-Nitrosodiphenylamine	350	U	350	350	U	350	350	U	350	340	U	340
Naphthalene	350	U	350	350	U	350	350	U	350	340	U	340
Nitrobenzene	350	U	350	350	U	350	350	U	350	340	U	340
Pentachlorophenol	880	UJ	880	860	UJ	860	860	UJ	860	860	UJ	860
Phenanthrene	19	J	350	350	U	350	350	U	350	340	U	340
Phenol	350	U	350	350	U	350	350	U	350	340	U	340
Pyrene	350	U	350	350	U	350	350	U	350	340	U	340

Constituent	J030R1 Location 9 Sample Date 04/15/05			J030R2 Location 10 Sample Date 04/15/05			J030R3 Location 11 Sample Date 04/15/05			J030R4 Location 12 Sample Date 04/15/0		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs												
Aroclor-1016	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1221	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1232	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1242	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1248	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1254	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1260	14	U	14	14	U	14	14	U	14	14	U	14
Pesticides												
Aldrin	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Alpha-BHC	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
alpha-Chlordane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Delta-BHC	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Dichlorodiphenyldichloroethane	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Dichlorodiphenyldichloroethylene	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Dichlorodiphenyltrichloroethane	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Dieldrin	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Endosulfan I	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Endosulfan II	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Endosulfan sulfate	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Endrin	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Endrin aldehyde	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Endrin ketone	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Gamma-BHC (Lindane)	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030R1 Location 9 Sample Date 04/15/05			J030R2 Location 10 Sample Date 04/15/05			J030R3 Location 11 Sample Date 04/15/05			J030R4 Location 12 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Pesticides (continued)												
gamma-Chlordane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Heptachlor	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Heptachlor epoxide	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Methoxychlor	17	U	17	17	U	17	17	U	17	18	U	18
Toxaphene	170	UJ	170	170	UJ	170	170	UJ	170	180	UJ	180
SVOAs												
1,2,4-Trichlorobenzene	340	U	340	350	U	350	350	U	350	52	J	360
1,2-Dichlorobenzene	340	U	340	350	U	350	350	U	350	360	U	360
1,3-Dichlorobenzene	340	U	340	350	U	350	350	U	350	360	U	360
1,4-Dichlorobenzene	340	U	340	350	U	350	350	U	350	360	U	360
2,4,5-Trichlorophenol	860	UJ	860	870	UJ	870	870	UJ	870	890	UJ	890
2,4,6-Trichlorophenol	340	UJ	340	350	UJ	350	350	UJ	350	360	UJ	360
2,4-Dichlorophenol	340	U	340	350	U	350	350	U	350	360	U	360
2,4-Dimethylphenol	340	U	340	350	U	350	350	U	350	360	U	360
2,4-Dinitrophenol	860	U	860	870	U	870	870	U	870	890	U	890
2,4-Dinitrotoluene	340	U	340	350	U	350	350	U	350	360	U	360
2,6-Dinitrotoluene	340	U	340	350	U	350	350	U	350	360	U	360
2-Chloronaphthalene	340	U	340	350	U	350	350	U	350	390	U	390
2-Chlorophenol	340	U	340	350	U	350	350	U	350	360	U	360
2-Methylnaphthalene	25	J	340	350	U	350	350	U	350	77	J	360
2-Methylphenol (cresol, o-)	340	U	340	350	U	350	350	U	350	360	U	360
2-Nitroaniline	860	U	860	870	U	870	870	U	870	890	U	890
2-Nitrophenol	340	U	340	350	U	350	350	U	350	360	U	360
3+4 Methylphenol (cresol, m+p)	340	U	340	350	U	350	350	U	350	360	U	360
3,3'-Dichlorobenzidine	340	U	340	350	U	350	350	U	350	360	U	360
3-Nitroaniline	860	U	860	870	U	870	870	U	870	890	U	890
4,6-Dinitro-2-methylphenol	860	U	860	870	U	870	870	U	870	890	U	890
4-Bromophenylphenyl ether	340	U	340	350	U	350	350	U	350	360	U	360
4-Chloro-3-methylphenol	340	U	340	350	U	350	350	U	350	360	U	360
4-Chloroaniline	340	U	340	350	U	350	350	U	350	360	U	360
4-Chlorophenylphenyl ether	340	U	340	350	U	350	350	U	350	360	U	360
4-Nitroaniline	860	U	860	870	U	870	870	U	870	890	U	890
4-Nitrophenol	860	U	860	870	U	870	870	U	870	890	U	890
Acenaphthene	340	U	340	350	U	350	350	U	350	55	J	360
Acenaphthylene	340	U	340	350	U	350	350	U	350	360	U	360
Anthracene	340	U	340	350	U	350	350	U	350	150	J	360
Benzo(a)anthracene	340	U	340	350	U	350	350	U	350	350	J	360
Benzo(a)pyrene	340	U	340	350	U	350	350	U	350	270	J	360
Benzo(b)fluoranthene	340	U	340	350	U	350	350	U	350	190	J	360
Benzo(ghi)perylene	340	U	340	350	U	350	350	U	350	170	J	360
Benzo(k)fluoranthene	340	U	340	350	U	350	350	U	350	240	J	360
Bis(2-chloro-1-methylethyl)ether	340	U	340	350	U	350	350	U	350	360	U	360
Bis(2-Chloroethoxy)methane	340	U	340	350	U	350	350	U	350	360	U	360
Bis(2-chloroethyl) ether	340	U	340	350	U	350	350	U	350	360	U	360
Bis(2-ethylhexyl) phthalate	660	U	660	660	U	660	660	U	660	660	U	660
Butylbenzylphthalate	340	U	340	350	U	350	350	U	350	360	U	360
Carbazole	340	U	340	350	U	350	350	U	350	75	J	360
Chrysene	340	U	340	350	U	350	350	U	350	370		360

Attachment	1	Sheet No.	9 of 13
Originator	J. M. Capron	Date	08/23/0
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030R1 Location 9 Sample Date 04/15/05			J030R2 Location 10 Sample Date 04/15/05			J030R3 Location 11 Sample Date 04/15/05			J030R4 Location 12 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)												
Di-n-butylphthalate	660	U	660	350	UB	350	350	UB	350	660	U	660
Di-n-octylphthalate	340	U	340	350	U	350	350	U	350	360	U	360
Dibenz[a,h]anthracene	340	U	340	350	U	350	350	U	350	88	J	360
Dibenzofuran	340	U	340	350	U	350	350	U	350	43	J	360
Diethylphthalate	340	U	340	350	U	350	350	U	350	360	U	360
Dimethyl phthalate	340	U	340	350	U	350	350	U	350	360	U	360
Fluoranthene	340	U	340	350	U	350	350	U	350	730		360
Fluorene	340	U	340	350	U	350	350	U	350	71	J	360
Hexachlorobenzene	340	U	340	350	U	350	350	U	350	360	U	360
Hexachlorobutadiene	340	U	340	350	U	350	350	U	350	360	U	360
Hexachlorocyclopentadiene	340	U	340	350	U	350	350	U	350	360	U	360
Hexachloroethane	340	U	340	350	U	350	350	U	350	360	U	360
Indeno(1,2,3-cd)pyrene	340	U	340	350	U	350	350	U	350	160	J	360
Isophorone	340	U	340	350	U	350	350	U	350	360	U	360
N-Nitroso-di-n-dipropylamine	340	U	340	350	U	350	350	U	350	360	U	360
N-Nitrosodiphenylamine	340	U	340	350	U	350	350	U	350	20	J	360
Naphthalene	340	U	340	350	U	350	350	U	350	60	J	360
Nitrobenzene	340	U	340	350	U	350	350	U	350	360	U	360
Pentachlorophenol	860	UJ	860	870	UJ	870	870	UJ	870	890	UJ	890
Phenanthrene	340	U	340	350	U	350	350	U	350	620		360
Phenol	340	U	340	350	U	350	350	U	350	360	U	360
Pyrene	340	U	340	350	U	350	350	U	350	700		360

Constituent	J030R5 Location 13 Sample Date 04/15/05			J030R6 Location 14 Sample Date 04/15/05			J030R7 Location 15 Sample Date 04/15/05			J030R8 Duplicate of J030R7 Sample Date 04/15/0		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQI
PCBs												
Aroclor-1016	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1221	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1232	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1242	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1248	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1254	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1260	14	U	14	14	U	14	14	U	14	14	U	14
Pesticides												
Aldrin	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Alpha-BHC	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
alpha-Chlordane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Delta-BHC	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Dichlorodiphenyldichloroethane	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Dichlorodiphenyldichloroethylene	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Dichlorodiphenyltrichloroethane	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Dieldrin	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Endosulfan I	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030R5 Location 13 Sample Date 04/15/05			J030R6 Location 14 Sample Date 04/15/05			J030R7 Location 15 Sample Date 04/15/05			J030R8 Duplicate of J030R7 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Pesticides (continued)												
Endosulfan II	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Endosulfan sulfate	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Endrin	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Endrin aldehyde	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Endrin ketone	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Gamma-BHC (Lindane)	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
gamma-Chlordane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Heptachlor	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Heptachlor epoxide	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Methoxychlor	17	U	17	17	U	17	17	U	17	17	U	17
Toxaphene	170	UJ	170	170	UJ	170	170	UJ	170	170	UJ	170
SVOAs												
1,2,4-Trichlorobenzene	340	U	340	350	U	350	350	U	350	350	U	350
1,2-Dichlorobenzene	340	U	340	350	U	350	350	U	350	350	U	350
1,3-Dichlorobenzene	340	U	340	350	U	350	350	U	350	350	U	350
1,4-Dichlorobenzene	340	U	340	350	U	350	350	U	350	350	U	350
2,4,5-Trichlorophenol	860	UJ	860	860	UJ	860	870	UJ	870	870	UJ	870
2,4,6-Trichlorophenol	340	UJ	340	350	UJ	350	350	UJ	350	350	UJ	350
2,4-Dichlorophenol	340	U	340	350	U	350	350	U	350	350	U	350
2,4-Dimethylphenol	340	U	340	350	U	350	350	U	350	350	U	350
2,4-Dinitrophenol	860	U	860	860	U	860	870	U	870	870	U	870
2,4-Dinitrotoluene	340	U	340	350	U	350	350	U	350	350	U	350
2,6-Dinitrotoluene	340	U	340	350	U	350	350	U	350	350	U	350
2-Chloronaphthalene	340	U	340	350	U	350	350	U	350	350	U	350
2-Chlorophenol	340	U	340	350	U	350	350	U	350	350	U	350
2-Methylnaphthalene	34	J	340	69	J	350	350	U	350	350	U	350
2-Methylphenol (cresol, o-)	340	U	340	350	U	350	350	U	350	350	U	350
2-Nitroaniline	860	U	860	860	U	860	870	U	870	870	U	870
2-Nitrophenol	340	U	340	350	U	350	350	U	350	350	U	350
3+4 Methylphenol (cresol, m+p)	340	U	340	350	U	350	350	U	350	350	U	350
3,3'-Dichlorobenzidine	340	U	340	350	U	350	350	U	350	350	U	350
3-Nitroaniline	860	U	860	860	U	860	870	U	870	870	U	870
4,6-Dinitro-2-methylphenol	860	U	860	860	U	860	870	U	870	870	U	870
4-Bromophenylphenyl ether	340	U	340	350	U	350	350	U	350	350	U	350
4-Chloro-3-methylphenol	340	U	340	350	U	350	350	U	350	350	U	350
4-Chloroaniline	340	U	340	350	U	350	350	U	350	350	U	350
4-Chlorophenylphenyl ether	340	U	340	350	U	350	350	U	350	350	U	350
4-Nitroaniline	860	U	860	860	U	860	870	U	870	870	U	870
4-Nitrophenol	860	U	860	860	U	860	870	U	870	870	U	870
Acenaphthene	340	U	340	350	U	350	350	U	350	350	U	350
Acenaphthylene	340	U	340	350	U	350	350	U	350	350	U	350
Anthracene	340	U	340	350	U	350	350	U	350	350	U	350
Benzo(a)anthracene	340	U	340	17	J	350	350	U	350	350	U	350
Benzo(a)pyrene	340	U	340	350	U	350	350	U	350	350	U	350
Benzo(b)fluoranthene	340	U	340	350	U	350	350	U	350	350	U	350
Benzo(ghi)perylene	340	U	340	350	U	350	350	U	350	350	U	350
Benzo(k)fluoranthene	340	U	340	350	U	350	350	U	350	350	U	350
Bis(2-chloro-1-methylethyl)ether	340	U	340	350	U	350	350	U	350	350	U	350

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030R5 Location 13 Sample Date 04/15/05			J030R6 Location 14 Sample Date 04/15/05			J030R7 Location 15 Sample Date 04/15/05			J030R8 Duplicate of J030R7 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)												
Bis(2-Chloroethoxy)methane	340	U	340	350	U	350	350	U	350	350	U	350
Bis(2-chloroethyl) ether	340	U	340	350	U	350	350	U	350	350	U	350
Bis(2-ethylhexyl) phthalate	660	U	660	660	U	660	660	U	660	660	U	660
Butylbenzylphthalate	340	U	340	350	U	350	350	U	350	350	U	350
Carbazole	340	U	340	350	U	350	350	U	350	350	U	350
Chrysene	18	J	340	24	J	350	350	U	350	350	U	350
Di-n-butylphthalate	340	UB	340	350	UB	350	350	UB	350	350	UB	350
Di-n-octylphthalate	340	U	340	350	U	350	350	U	350	350	U	350
Dibenz[a,h]anthracene	340	U	340	350	U	350	350	U	350	350	U	350
Dibenzofuran	340	U	340	350	U	350	350	U	350	350	U	350
Diethylphthalate	340	U	340	350	U	350	350	U	350	350	U	350
Dimethyl phthalate	340	U	340	350	U	350	350	U	350	350	U	350
Fluoranthene	20	J	340	31	J	350	350	U	350	350	U	350
Fluorene	340	U	340	350	U	350	350	U	350	350	U	350
Hexachlorobenzene	340	U	340	350	U	350	350	U	350	350	U	350
Hexachlorobutadiene	340	U	340	350	U	350	350	U	350	350	U	350
Hexachlorocyclopentadiene	340	U	340	350	U	350	350	U	350	350	U	350
Hexachloroethane	340	U	340	350	U	350	350	U	350	350	U	350
Indeno(1,2,3-cd)pyrene	340	U	340	350	U	350	350	U	350	350	U	350
Isophorone	340	U	340	350	U	350	350	U	350	350	U	350
N-Nitroso-di-n-dipropylamine	340	U	340	350	U	350	350	U	350	350	U	350
N-Nitrosodiphenylamine	340	U	340	350	U	350	350	U	350	350	U	350
Naphthalene	340	U	340	33	J	350	350	U	350	350	U	350
Nitrobenzene	340	U	340	350	U	350	350	U	350	350	U	350
Pentachlorophenol	860	UJ	860	860	UJ	860	870	UJ	870	870	UJ	870
Phenanthrene	33	J	340	52	J	350	350	U	350	350	U	350
Phenol	340	U	340	350	U	350	350	U	350	350	U	350
Pyrene	19	J	340	27	J	350	350	U	350	350	U	350

Attachment B

Comparison of Statistical Soil Values to Action Levels at the 126-B-3 Waste Site, Excavated Area

Comparison of Statistical Soil Values to Action Levels at the 126-B-3 Waste Site, Excavated Area. (2 Pages)

COC/COPC	Statistical Result (mg/kg)		Remedial Action Goals (mg/kg)			Does the Result Exceed RAGs?	Does the Result Pass RESRAD Modeling ?
	95% UCL[a]	Maximum	Direct Exposure	Soil Concentration for Groundwater Protection	Soil Concentration for River Protection		
Arsenic	5.9 (<BG)	--	20[b]	20[b]	20[b]	No	--
Barium	93.4 (<BG)	--	5,600[c]	132[d]	400[e]	No	--
Beryllium	0.56 (<BG)	--	10.4[f]	1.51[d]	1.51[d]	No	--
Boron[g]	4.9	--	16,000[c]	320	--[h]	No	--
Cadmium[i]	0.30 (<BG)	--	13.9[f]	0.81[d]	0.81[d]	No	--
Chromium	12.2 (<BG)	--	80,000[c]	18.5[d]	18.5[d]	No	--
Cobalt	11.6 (<BG)	--	1,600[c]	32	--[h]	No	--
Copper	23.4	--	2,960[c]	59.2	22[d]	Yes	Yes[j]
Lead	8.3 (<BG)	--	353[k]	10.2[d]	10.2[d]	No	--
Manganese	467 (<BG)	--	11,200[c]	512[d]	--[h]	No	--
Mercury	--	0.03 (<BG)	24[c]	0.33[d]	0.33[d]	No	--
Molybdenum[g]	--	1.4	400[c]	8	--[h]	No	--
Nickel	15.9 (<BG)	--	1,600[c]	19.1[d]	27.4	No	--
Vanadium	66.9 (<BG)	--	560[c]	85.1[d]	--[h]	No	--
Zinc	62.4 (<BG)	--	24,000[c]	480	67.8[d]	No	--
Aroclor-1260	--	0.017	0.5[l]	0.017[m]	0.017[m]	No	--
1,2,4-trichlorobenzene	--	0.052	800[c]	7	45.4	No	--
2-methylnaphthalene	--	0.39	320[c]	3.2	--[h]	No	--
Acenaphthene	--	0.055	4,800[c]	96	129	No	--
Anthracene	--	0.15	24,000[c]	240	1,920	No	--
Benzo(a)anthracene	--	0.35	1.37[l]	0.33[m]	0.33[m]	Yes	Yes[j]
Benzo(a)pyrene	--	0.28	0.33[m]	0.33[m]	0.33[m]	No	--
Benzo(b)fluoranthene	--	0.19	1.37[l]	0.33[m]	0.33[m]	No	--
Benzo(g,h,i)perylene[n]	--	0.17	2,400[c]	48	192	No	--
Benzo(k)fluoranthene	--	0.24	13.7[l]	0.33[m]	0.33[m]	No	--
Carbazole	--	0.075	50[l]	0.437	--[h]	No	--
Chrysene	--	0.37	137[l]	1.2	0.33[m]	Yes	Yes[j]
Dibenz(a,h)anthracene	--	0.088	0.33[m]	0.33[m]	0.33[m]	No	--
Dibenzofuran	--	0.099	160[c]	3.20	--[h]	No	--
Diethylphthalate	--	0.041	64,000[c]	1,280	4,600	No	--

Comparison of Statistical Soil Values to Action Levels at the 126-B-3 Waste Site, Excavated Area. (2 Pages)

COC/COPC	Statistical Result (mg/kg)		Remedial Action Goals (mg/kg)			Does the Result Exceed RAGs?	Does the Result Pass RESRAD Modeling ?
	95% UCL[a]	Maximum	Direct Exposure	Soil Concentration for Groundwater Protection	Soil Concentration for River Protection		
Fluoranthene	--	0.73	3,200[c]	64	18	No	--
Indeno(1,2,3-cd)pyrene	--	0.16	1.37[l]	0.33[m]	0.33[m]	No	--
N-nitrosodiphenylamine	--	0.10	204[l]	1.79	1.946	No	--
Naphthalene	--	0.12	1,600[c]	16	988	No	--
Phenanthrene[n]	--	0.62	24,000[c]	240	1,920	No	--
Pyrene	--	0.70	2,400[c]	48	192	No	--

[a] As determined by the *126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations.*
[b] The cleanup value of 20 mg/kg has been agreed to by Tri-Party project managers. The basis for 20 mg/kg is provided in Section 2.1.2.1 of the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b).
[c] Noncarcinogenic cleanup level calculated from WAC 173-340-740(3), Method B, 1996.
[d] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).
[e] Value based on 100 X MCL X 2 (groundwater to river DAF).
[f] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996).
[g] No Hanford Site-specific or Washington State background value available.
[h] No cleanup level is available from the Ecology Cleanup Levels and Risk Calculations tables, and no toxicity values are available to calculate cleanup levels.
[i] Hanford Site-specific background is not available; not evaluated during background study. Value used is from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[j] Based on the *100 Area Analogous Sites RESRAD Calculations,* with the groundwater table elevation of 120 m and a clean zone extending from groundwater to an elevation of 130 m.
[k] A WAC 173-340-740(3) (1996) value for lead is not available. This value is based on the *Guidance Manual for the Integrated Exposure Update Biokinetic Model for Lead in Children* (EPA 1994).
[l] Carcinogenic cleanup level calculated per WAC 173-340-740(3), Method B, 1996.
[m] Where cleanup levels are less than RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996).
[n] Toxicity data for this chemical are not available. Cleanup levels for benzo(g,h,i)perylene and phenanthrene are based on the surrogate chemicals pyrene and anthracene, respectively.

--	= not applicable	NV	= no value
BG	= background	RAG	= remedial action goal
COC	= contaminant of concern	RDL	= required detection limit
COPC	= contaminant of potential concern	RESRAD	= RESidual RADioactivity (dose model)
DAF	= dilution attenuation factor	UCL	= upper confidence limit
MCL	= maximum contaminant level	WAC	= *Washington Administrative Code*

Attachment C

126-B-3 (Excavated Area) Hazard Quotient and Carcinogenic Risk Calculation, Calculation No. 0100B-CA-V0261

CALCULATION COVER SHEET

Project Title 100-B/C Area Remaining Sites **Job No.** 22192
Area 100-B/C
Discipline Environmental *__Calc. No.__ 0100B-CA-V0261
Subject 126-B-3 (Excavated Area) Hazard Quotient and Carcinogenic Risk Calculation
Computer Program Excel **Program No.** Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These documents should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ **Preliminary** ☐ **Superseded** ☐ **Voided** ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Summary = 3 Total = 4	J. M. Capron JM Capron 8/23/05	T. M. Blakley T. M. Blakley 8/23/05	L. M. Dittmer T. M. Blakley for 8/23/05	D. N. Strom [signature]	8-25-05

SUMMARY OF REVISION	

*Obtain Calc. No. from DIS

Bechtel Hanford, Inc. CALCULATION SHEET

Originator:	J. M. Capron *JMC*	Date:	08/23/05	Calc. No.:	0100B-CA-V0261	Rev.:	0
Project:	100-B/C Area Remaining Sites	Job No:	22192	Checked:	T. M. Blakley *TMB*	Date:	*8/23/05*
Subject:	126-B-3 (Excavated Area) Hazard Quotient and Carcinogenic Risk Calculation					Sheet No.	1 of 3

PURPOSE:

Provide documentation to support the calculation of the hazard quotient (HQ) and excess carcinogenic risk for the Remaining Sites Verification Package for the 126-B-3 waste site (excavated area). In accordance with the remedial action goals (RAGs) in the *Remedial Design Report/Remedial Action Work Plan for the 100 Areas* (RDR/RAWP) (DOE-RL 2005), the following criteria must be met:

1) An HQ of <1.0 for all individual noncarcinogens
2) A cumulative HQ of <1.0 for noncarcinogens
3) An excess cancer risk of <1 x 10^{-6} for individual carcinogens
4) A cumulative excess cancer risk of <1 x 10^{-5} for carcinogens.

GIVEN/REFERENCES:

1) BHI, 2005, *126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations*, Calc No. 0100B-CA-V0260, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

2) DOE-RL, 2005, *Remedial Design Report/Remedial Action Work Plan for the 100 Areas*, DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

3) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.

SOLUTION:

1) Generate an HQ for each noncarcinogenic constituent detected above background or the required detection limit/practical quantitation limit and compare it to the individual HQ requirement of <1.0 (DOE-RL 2005).

2) Sum the HQs and compare this value to the cumulative HQ requirement of <1.0.

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background or the required detection limit/practical quantitation limit and compare it to the excess cancer risk requirement of <1 x 10^{-6} (DOE-RL 2005).

4) Sum the excess cancer risk values and compare it to the cumulative cancer risk requirement of <1 x 10^{-5}.

METHODOLOGY:

Hazard quotient and carcinogenic risk calculations were computed using the statistical data provided in BHI (2005). Of the contaminants of potential concern for the site, boron and molybdenum require the HQ calculations because these analytes were detected and a Washington State or Hanford Site background value is not available. Copper is included because it was detected at a concentration above its Hanford Site background value. Aroclor-1260 and multiple semivolatile organic compounds (as listed in Table 1) are included because they were detected by laboratory analysis and cannot be attributed to natural occurrence. An example of the HQ and risk calculations is presented below:

1) For example, the statistical value for boron is 4.9 mg/kg, divided by the noncarcinogenic RAG value of 16,000 mg/kg (boron is identified as a noncarcinogen in WAC 173-340-740[3]), is 3.1×10^{-4}. Comparing this value, and all other individual values, to the requirement of <1.0, this criterion is met.

2) After the HQ calculation is completed for the appropriate analytes, the cumulative HQ is obtained by summing the individual values. The sum of the HQ values is 1.4×10^{-2}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the statistical value is divided by the carcinogenic RAG value, then multiplied by 1×10^{-6}. For example, the maximum value for aroclor-1260 is 0.017 mg/kg; divided by 0.5 mg/kg, and multiplied as indicated is 3.4×10^{-8}. Comparing this value, and all other individual values, to the requirement of $<1 \times 10^{-6}$, this criterion is met.

4) After these calculations are completed for the carcinogenic analytes, the cumulative excess cancer risk can be obtained by summing the individual values. The sum of the excess cancer risk values is 3.3×10^{-6}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

RESULTS:

1) List individual noncarcinogens and corresponding HQs >1.0: None
2) List the cumulative noncarcinogenic HQ: 1.4×10^{-2}
3) List individual carcinogens and corresponding excess cancer risk $>1 \times 10^{-6}$: None
4) List the cumulative excess cancer risk: 3.3×10^{-6}

Table 1 shows the results of the calculations.

Table 1. Hazard Quotient and Excess Cancer Risk Results for the 126-B-3 Waste Site (Excavated Area).

Contaminants of Concern/ Contaminants of Potential Concern[a]	Maximum Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Boron	4.9	16,000	3.1E-04	--	--
Copper	23.4	2,960	7.9E-03	--	--
Molybdenum	1.4	400	3.5E-03	--	--
Semivolatiles					
Acenaphthene	0.055	4,800	1.1E-05	--	--
Anthracene	0.15	24,000	6.3E-06	--	--
Benzo(a)anthracene	0.35	--	--	1.37	2.6E-07
Benzo(a)pyrene	0.28	--	--	0.33[c]	8.5E-07
Benzo(b)fluoranthene	0.19	--	--	1.37	1.4E-07
Benzo(k)fluoranthene	0.24	--	--	13.7	1.8E-08
Benzo(g,h,i)perylene	0.17	2,400	7.1E-05	--	--
Carbazole	0.075	--	--	50	1.5E-09
Chrysene	0.37	--	--	137	2.7E-09
Dibenzo(a,h)anthracene	0.088	--	--	0.33[c]	2.7E-07
Dibenzofuran	0.099	160	6.2E-04	--	--
Diethylphthalate	0.041	64,000	6.4E-07	--	--
Fluoranthene	0.73	3,200	2.3E-04	--	--
Fluorene	0.071	3,200	2.2E-05	--	--
Indeno(1,2,3-cd) pyrene	0.16	--	--	1.37	1.2E-07
Methylnapthalene; 2-	0.39	320	1.2E-03	--	--
Naphthalene	0.12	1,600	7.5E-05	--	--
Nitrosodiphenylamine;N-	0.10	--	--	204	4.9E-10
Phenanthrene	0.62	24,000	2.6E-05	--	--
Pyrene	0.70	2,400	2.9E-04	--	--
Trichlorobenzene; 1,2,4-	0.052	800	6.5E-05	--	--
Polychlorinated Biphenyls					
Aroclor-1260	0.017	--	--	0.5	3.4E-08
Totals					
Cumulative Hazard Quotient:			**1.4E-02**		
Cumulative Excess Cancer Risk:					**3.3E-06**

Notes:
RAG = remedial action goal
-- = not applicable
[a] = From BHI (2005).
[b] = Value obtained from *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.
[c] = Total carcinogenic risk calculated using the cleanup level instead of the required detection limit, per WAC 173-340-740(3), Method B, 1996. Individual carcinogenic risk calculated using the required detection limit.

CONCLUSION:

This calculation demonstrates that the excavated area of the 126-B-3 waste site meets the requirements for the hazard quotients and excess carcinogenic risk as identified in the RDR/RAWP (DOE-RL 2005).

Attachment D

Work Instruction for Verification Sampling of Waste Site 126-B-3,
184-B Coal Pit Dumping Area, Work Instruction No. 0100B-WI-G0002

100 AREA REMAINING SITES
APPROVAL PAGE

126-B-3, 184-B Coal Pit Dumping Area

Work Instruction No. 0100B-WI-G0002

Approved By:

______________________ **DOE/RL Lead** **Date:** 4/6/05
D. C. Smith

______________________ **EPA/Ecology Lead** **Date:** 4/6/05
fd **D. A. Faulk**

BHI-DIS Mjp 4-8-05

WORK INSTRUCTION

FOR

VERIFICATION SAMPLING OF WASTE SITE 126-B-3, 184-B COAL PIT DUMPING AREA

Rev.	Reason For Revision	Author	Technical Reviewer(s)	Technical Reviewer(s)	Approval Authority	Approval Date
0	Approved for sampling.	WST	MTS	TMB	DNS	4-5-05

HANFORD	RICHLAND ENVIRONMENTAL RESTORATION PROJECT	Job No. 22192
		Work Instruction No. 0100B-WI-G0002
		Sheet 1 of 47

1.0 PURPOSE

This work instruction provides the sampling and analytical requirements for verification sampling of waste site 126-B-3, 184-B Coal Pit Dumping Area, as required by the *100 Area Remedial Action Sampling and Analysis Plan* (DOE-RL 2005a). Only the verification sampling for the excavation is described in this work instruction. The verification sampling to support closeout of the waste staging pile area will be provided in a separate work instruction after the staging piles have been sent to the Environmental Restoration Disposal Facility (ERDF).

2.0 SITE DESCRIPTION

The 126-B-3 waste site was originally excavated to store coal for use in the 184-B Powerhouse from 1943 through 1968 and was known as the 184-B Coal Pit. After coal storage was discontinued, the site was used as a demolition landfill. Approximately 75% of this pit was used for waste disposal of inert demolition debris and was covered with about 0.3 m (1 ft) of pit-run backfill material. As of 1995, the remaining 25% of this pit had been backfilled and the surface stabilized to match the surrounding grade (Appendix A).

2.1 Location

The 126-B-3 waste site is located approximately 450 m (1476 ft) northwest of 105 B Reactor. Figure 1 provides a map of the site location.

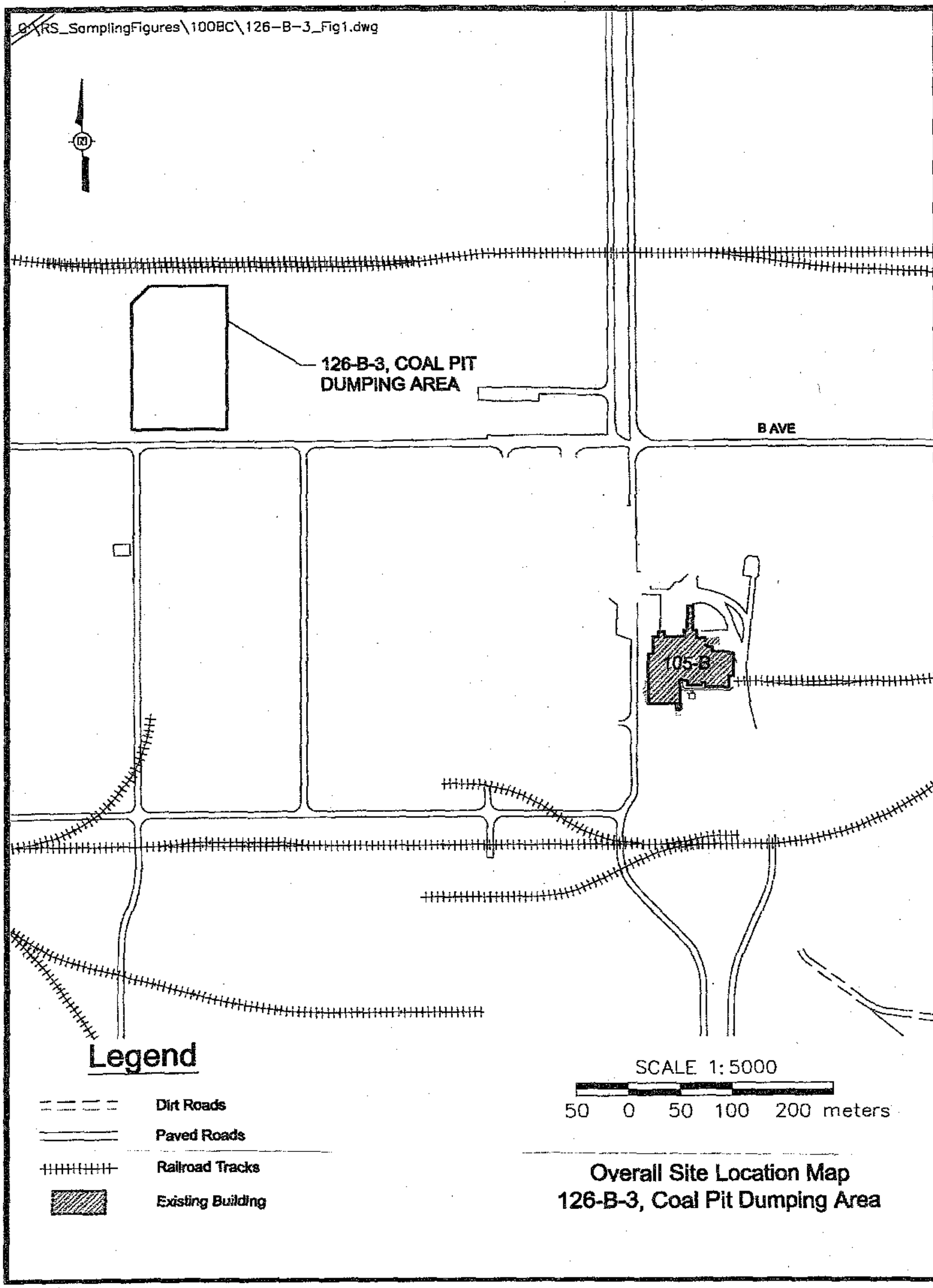
2.2 History

The 184-B Coal Pit was used for coal storage from 1943 through 1968. Beginning in the early to mid-1970s and after coal storage was discontinued, the site was used as a dumping area for demolished 100-B facilities. The 108-B Tritium Separation Facility was decommissioned, and the demolition was completed in May 1985. Clean rubble and debris from this demolition were disposed in the 184-B Coal Pit. The radiological waste materials from the 108-B Facility were disposed of in a 200 Area burial ground. Prior to use as a tritium separation facility, the 108-B Facility was used for mixing and addition of chemicals used in the treatment of the reactor cooling water. A historical photograph of the 126-B-3 site during use for disposal of demolition debris is shown in Appendix B.

3.0 BACKGROUND INFORMATION

The 126-B-3 site was evaluated during March 2003 confirmatory sampling efforts to make a decision as to whether remedial action would be required at the site. Based on the observations from the site visit, geophysical survey information, and results of confirmatory sampling, a decision was made that remedial action at the site was necessary (BHI 2003c). The following subsections provide discussion of the information that was used to develop the confirmatory sampling design (BHI 2003b). The results of the confirmatory sampling are also presented and provide support for development of the remedial action strategy discussed in Section 4.0 and the verification sampling design proposed in Section 5.0 of this work instruction.

Figure 1. 126-B-3 Site Location Map.



3.1 Site Geophysical Survey Information

A geophysical survey of the site was performed in March 2003 (Bergstrom and Mitchell 2003). The results of this survey are shown in Figure 2. Concentrations of anomalous features were detected that are characteristic of buried debris with relatively high concentrations of metal. Several notable linear features (buried pipe or utilities) were also detected among the scattered debris. The results of the geophysical survey were used to develop the confirmatory sampling design.

3.2 Confirmatory Sample Results

The geophysical survey results, historical photographs, and the site visit information were used to develop a stratified sample design with focused sampling of soil and debris for the confirmatory sampling activity. The site was stratified into three areas for evaluation with a total of six test pits excavated. Figure 3 provides a historical photograph with the boundaries of the three sample areas depicted. The test pit locations are shown in Figure 4. Confirmatory sampling was performed March 21 and 24, 2003, as described in *Waste Site Evaluation for 126-B-3 Dumping Area* (BHI 2003b) and documented by the sampler in the field logbook (BHI 2003a). In addition to the contaminants of potential concern (COPCs) identified in the sampling work instruction (BHI 2003a), field decisions were made during sample collection to add supplemental analyses to support waste characterization for some samples based on field observation. These supplemental analyses were added on a case-by-case basis in consultation with the Waste Management organization and included Toxic Characteristic Leaching Procedure (TCLP) metals, TCLP semivolatile organic analysis (SVOA), cyanide, and sulfide analysis.

A summary of the field observations and confirmatory sampling activities for each of the three areas is as follows:

- Area 1 was identified using the geophysical survey data (Figure 2) and the historical photograph (Figure 3) showing the location of the burn pit. One test pit (test pit 6) was excavated in Area 1 to a depth of approximately 4.3 m (14 ft) below surface grade. At a depth of approximately 0.6 m (2 ft), suspect asbestos-containing material and concrete debris were encountered. A sample of a pink, wool-like material and a sample of black tar/mastic was collected and submitted for asbestos analysis. A sample of pipe lagging was also collected for asbestos analysis. At a depth between 2.1 to 2.4 m (7 to 8 ft), ash was found and continued to a depth of approximately 4.6 m (15 ft) below ground surface. A sample of a refractory brick in the ash material was collected for asbestos analysis. A sample and a duplicate sample of black ash were collected at a depth of approximately 4.3 m (14 ft). The excavation continued until native soil was encountered at a depth of approximately 4.9 to 5.0 m (16 to 16.5 ft). One sample of native soil was collected and submitted for analysis of the COPCs. The test pit was then backfilled. A summary of the sample types that were collected and the laboratory analyses that were performed is provided in Table 1.

Figure 2. Map of Geophysical Survey Results.

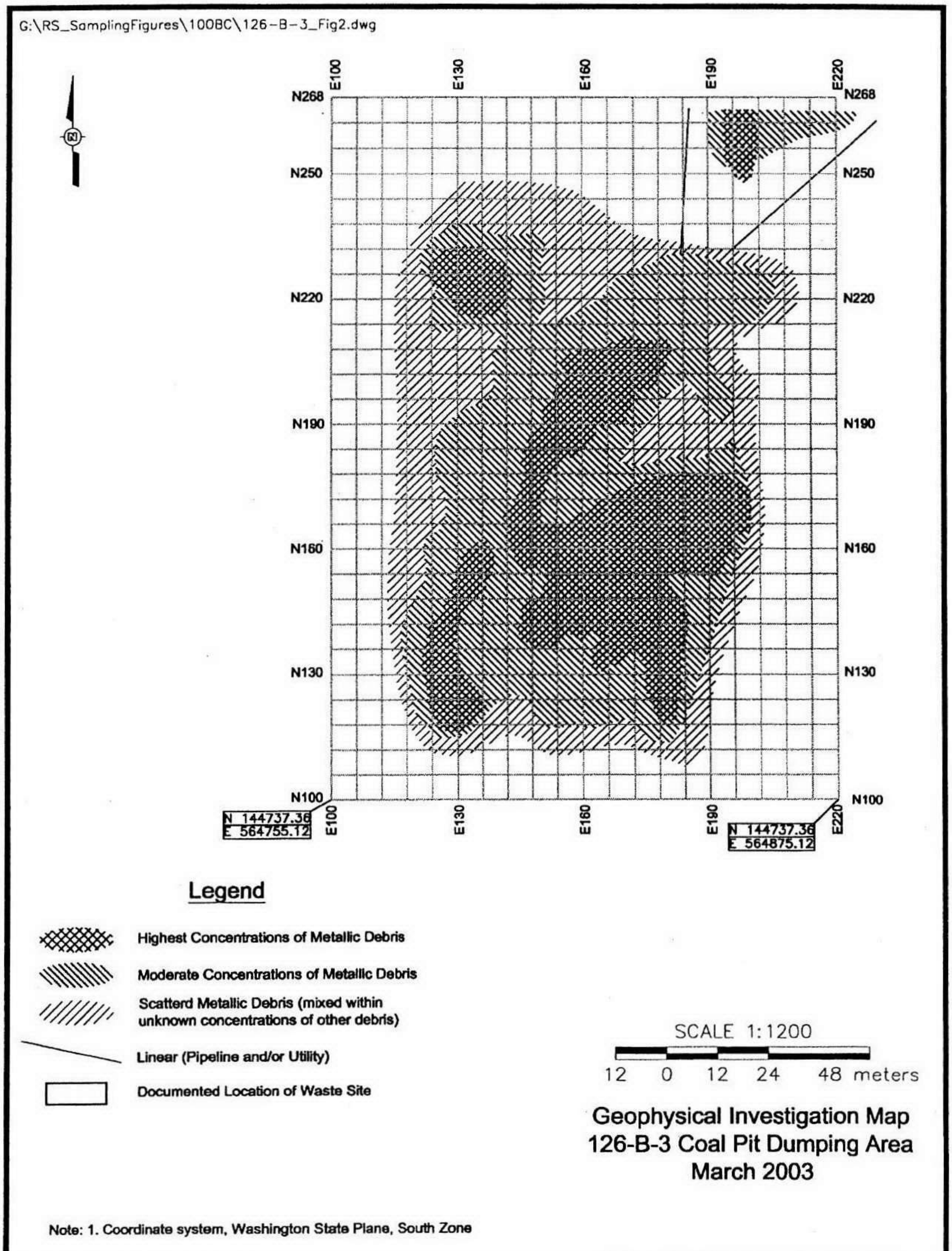


Figure 3. Boundary of Sample Areas Identified Using Historical Photograph.

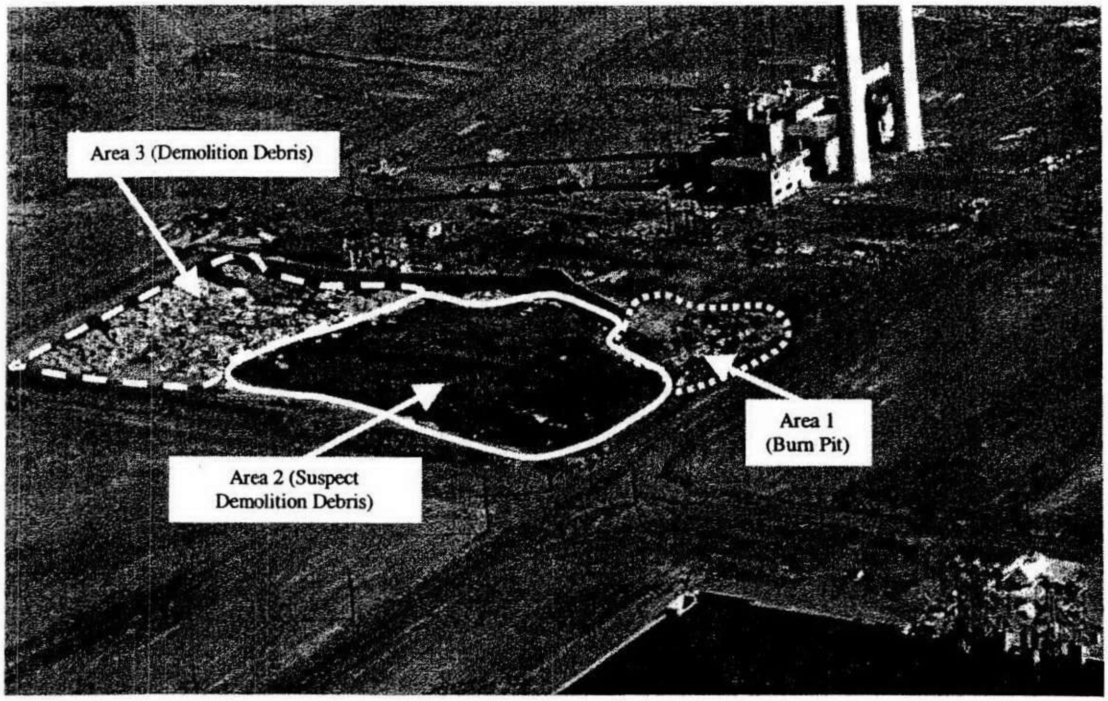
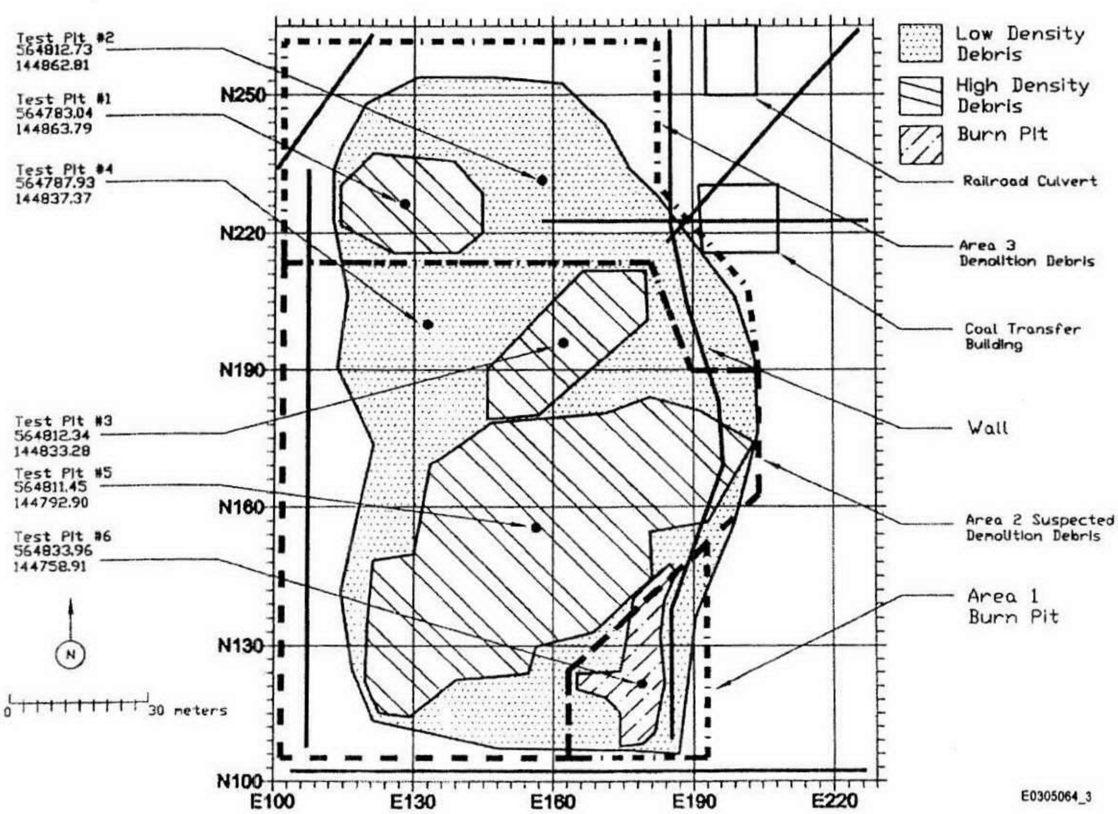


Figure 4. Confirmatory Sampling Design.



- Area 2 was identified using the geophysical survey data (Figure 2) and the historical photograph showing the coal pit area prior to subsequent disposal of demolition debris (Figure 3). Three test pits were excavated in Area 2. Test pits 3 and 5 were located in the center of anomalies identified by the geophysical survey as having high concentrations of subsurface metallic debris. Test pit 4 was located in an area believed to have moderate concentrations of subsurface metallic debris as noted by the geophysical survey. The surface soil at the location of test pit 5 had suspect fire/kiln brick and black ash present. At a depth of 0.5 m (18 in.) additional fire/kiln brick was found and sampled for asbestos. Concrete slabs containing re-bar were found at a depth of about 0.9 m (3 ft). A large amount of conduit and a 0.013-m (0.5-in.) water pipe were encountered at about 1.5 m (5 ft). Excavation progressed slowly because of the considerable amount of concrete and metal debris present. Black ash was found at 3.7 m (12 ft), continuing until native soil was encountered at a depth of approximately 4.9 (16 ft). A sample of soil was collected at a depth of approximately 5.0 to 5.2 m (16.5 to 17 ft). The test pit was then backfilled. A summary of the sample types that were collected and the laboratory analyses that were performed is provided in Table 1.

  At a depth of approximately 0.6 m (2 ft) below ground surface in test pit 3, re-bar, wire rope, conduit, and metal pipe were encountered. A layer of ash was located from 2.4 m (8 ft) continuing to a depth of 4.0 m (13 ft) below ground surface where native soil was encountered. A sample of soil was collected at a depth of approximately 4.3 m (14 ft). The test pit was then backfilled. A summary of the sample types that were collected and the analyses that were performed is provided in Table 1.

  A gasket was found on the surface soil at test pit 4 and sampled for asbestos. During the excavation of the test pit, concrete and metal debris were encountered at a depth of approximately 0.3 m (1 ft). A 0.3- to 0.5-m (12- to 18-in.)-thick ash layer was found at a depth of 2.4 m (8 ft), and a sample of native soil was collected at a depth of 3.0 m (10 ft). A summary of the sample types that were collected and the laboratory analyses that were performed is provided in Table 1.

- Area 3 was identified as an area receiving demolition debris as shown in the historical photograph (Figure 3) and using the geophysical survey data (Figure 2). Two test pits were excavated in Area 3. Test pit 1 was located in the center of an anomaly identified by the geophysical survey as having high concentrations of subsurface metallic debris. Test pit 2 was located in an area believed to have moderate concentrations of subsurface metallic debris as noted by the geophysical survey.

  Concrete and metal debris were encountered during excavation of test pit 1 at a depth of approximately 0.5 m (18 in.). A 0.2-m (6-in.) ash layer was found at a depth of 2.7 m (9 ft). The excavation continued to a depth of approximately 3 m (10 ft) where native soil was encountered and a sample collected. A summary of the sample types that were collected and the analyses that were performed is provided in Table 1.

  Test pit 2 was excavated to a depth of approximately 3.4 m (11 ft). Pipe, wire, and concrete debris were encountered at a depth of 0.6 m (2 ft). A soil sample and a duplicate soil sample were collected from 3.0 to 3.6 m (10 to 11 ft) below ground surface. A summary of the sample types that were collected and the analyses that were performed is provided in Table 1.

Table 1. Confirmatory Sampling Summary. (2 Pages)

Location	Sample Type	Sample No.	Depth [a]	Sample Analyses
Area 1				
Test pit 6	Ash	J00JJ7	14 ft	GEA, gross alpha, gross beta, ICP metals, mercury, metals by ICP (TCLP), mercury (TCLP), pesticides, PCBs, SVOA, SVOA (TCLP), TPH, cyanide, sulfide
Test pit 6	Ash	J00JK2	14 ft	Asbestos
Test pit 6	Ash - duplicate of J00JJ7	J00JJ8	14 ft	GEA, gross alpha, gross beta, ICP metals, mercury, metals by ICP (TCLP), mercury (TCLP), pesticides, PCBs, SVOA, SVOA (TCLP), TPH, cyanide, sulfide
Test pit 6	Ash - duplicate of J00JK2	J00JK3	14 ft	Asbestos
Test pit 6	Soil	J00JK0	16 - 16.5 ft	GEA, gross alpha, gross beta, ICP metals, mercury, pesticides, PCBs, semi-VOA, TPH
Test pit 6	Soil	J00JK4	16 - 16.5 ft	Asbestos
Test pit 6	ACM, debris (wool like)	J00JM2	Depth not specified	Asbestos
Test pit 6	ACM, debris (tar/mastic)	J00JM3	Depth not specified	Asbestos
Test pit 6	ACM, debris (pipe lagging)	J00JM4	Depth not specified	Asbestos
Test pit 6	ACM, debris (refractory brick)	J00JM5	Depth not specified	Asbestos
Area 2				
Test pit 5	Soil	J00JR7	16.5 - 17 ft	GEA, gross alpha, gross beta, tritium, ICP metals, mercury, pesticides, PCBs, semi-VOA, TPH
Test pit 5	Soil	J00JM0	16.5 - 17 ft	Asbestos
Test pit 5	ACM, debris (fire brick)	J00JN8	0 - 2 ft	Asbestos
Test pit 3	Soil	J00JR8	14 ft	GEA, gross alpha, gross beta, tritium, ICP metals, mercury, pesticides, PCBs, semi-VOA, TPH
Test pit 3	Soil	J00JM1	14 ft	Asbestos

Table 1. Confirmatory Sampling Summary. (2 Pages)

Location	Sample Type	Sample No.	Depth [a]	Sample Analyses
Test pit 4	Soil	J00JR9	10 ft	GEA, gross alpha, gross beta, tritium, ICP metals, mercury, PCBs, SVOA, pesticides, SVOA (TCLP), TPH, cyanide, sulfide
Test pit 4	Soil	J00JV2	10 ft	Asbestos
Test pit 4	ACM Debris (gasket)	J00JM6	Surface	GEA, gross alpha, gross beta, ICP metals, mercury, metals by ICP (TCLP), mercury (TCLP), pesticides, PCBs, SVOA, SVOA (TCLP), TPH, cyanide, sulfide
Test pit 4	ACM Debris (gasket)	J00JN9	Surface	Asbestos
Area 3				
Test pit 1	Soil	J00JT3	10 ft	GEA, gross alpha, gross beta, tritium, ICP metals, mercury, pesticides, PCBs, semi-VOA, TPH
Test pit 1	Soil	J00JV3	10 ft	Asbestos
Test pit 1	Debris	N/A	NA	N/A
Test pit 2	Soil	J00JT4	10 - 11 ft	GEA, gross alpha, gross beta, tritium, ICP metals, mercury, PCBs, SVOA, pesticides, SVOA (TCLP), TPH, cyanide, sulfide
Test pit 2	Soil	J00JV4	10 - 11 ft	Asbestos
Test pit 2	Soil - duplicate of J00JT4	J00JT5	10 - 11 ft	GEA, gross alpha, gross beta, tritium, ICP metals, mercury, PCBs, pesticides, SVOA, SVOA (TCLP), TPH, cyanide, sulfide
Test pit 2	Soil - duplicate of J00JV4	J00JV5	10 - 11 ft	Asbestos
Quality Control Samples				
Equipment blank	Silica sand	J00JT6	N/A	GEA, gross alpha, gross beta, ICP metals, mercury, semi-VOA

[a] Field estimate of approximate sample depth in feet below grade.

ACM = asbestos-containing material
GEA = gamma energy analysis
ICP = inductively coupled plasma
N/A = not applicable
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TCLP = toxic characteristic leachate procedure
TPH = total petroleum hydrocarbon
VOA = volatile organic analysis

The samples were analyzed at offsite commercial laboratories, and the results were reviewed against the cleanup criteria specified in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b). The laboratory results for the confirmatory sampling are provided in Appendix C (Table C-1). The laboratory results for the additional waste characterization analysis requested for select confirmatory samples are also provided in Appendix C (Table C-2).

Asbestos was found in debris and in soil. Petroleum hydrocarbons exceeded direct exposure cleanup criteria. Barium, cadmium, mercury, lead, selenium, aldrin, DDE, DDT, endosulfan sulfate, and chrysene were detected above the cleanup criteria for protection of groundwater. Benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, endosulfan II, indeno(1,2,3-cd)pyrene, and arsenic were detected but at concentrations less than cleanup criteria. No radionuclides were detected above background levels. Based on the results of the field observations and the laboratory analysis, it was determined that the site required remediation.

4.0 SUMMARY OF CLEANUP ACTIVITIES

Remedial action of the 126-B-3 site was initiated on September 4, 2003, and continued through September 17, 2003, with 5,548 bank cubic meters (BCM) disposed of at the ERDF. Remedial action was restarted on October 4, 2004, and completed on December 27, 2004, with an additional 37,554 BCM removed for disposal to ERDF. Batteries, lead bricks, rubber gaskets, a compressor, metal scrap, concrete rubble, miscellaneous asbestos-containing material, and contaminated soil and ash were removed. Appendix B provides several photographs of debris items. All excavated material is in the process of being disposed of at the ERDF.

During the remedial action, in-process samples of soil and suspect waste materials were collected as needed to support waste characterization and evaluation of the waste profile for disposal of excavated material. Samples of paint (J01786, J00YB7, and J00YB8) from metal debris were collected for laboratory analysis. Soil located beneath an area of batteries was sampled (J01YT4). Oil-stained soil discovered during sampling was also sampled (J022F6). The analytical results for the waste characterization samples collected during remedial action are provided in Appendix C (Table C-3). Appendix B provides photographs of some of the debris items that were sampled.

Near the end of the excavation work, six biased soil samples were collected for total petroleum hydrocarbon (TPH) analysis as an indicator to assist with guiding the extent of excavation. The analytical results for these samples are provided in Appendix C (Table C-4) and were used to assist with additional excavation work.

Figure 5 provides the waste site pre-excavation topographic survey, and Figure 6 shows the post-excavation topographic waste site survey. The site was excavated to a maximum depth of 7 m (22.97 ft); however, some areas were excavated to shallower depths of less than 4 m (13.12 ft).

Figure 5. Pre-Excavation Civil Survey of the 126-B-3, 184-B Coal Pit Dumping Area.

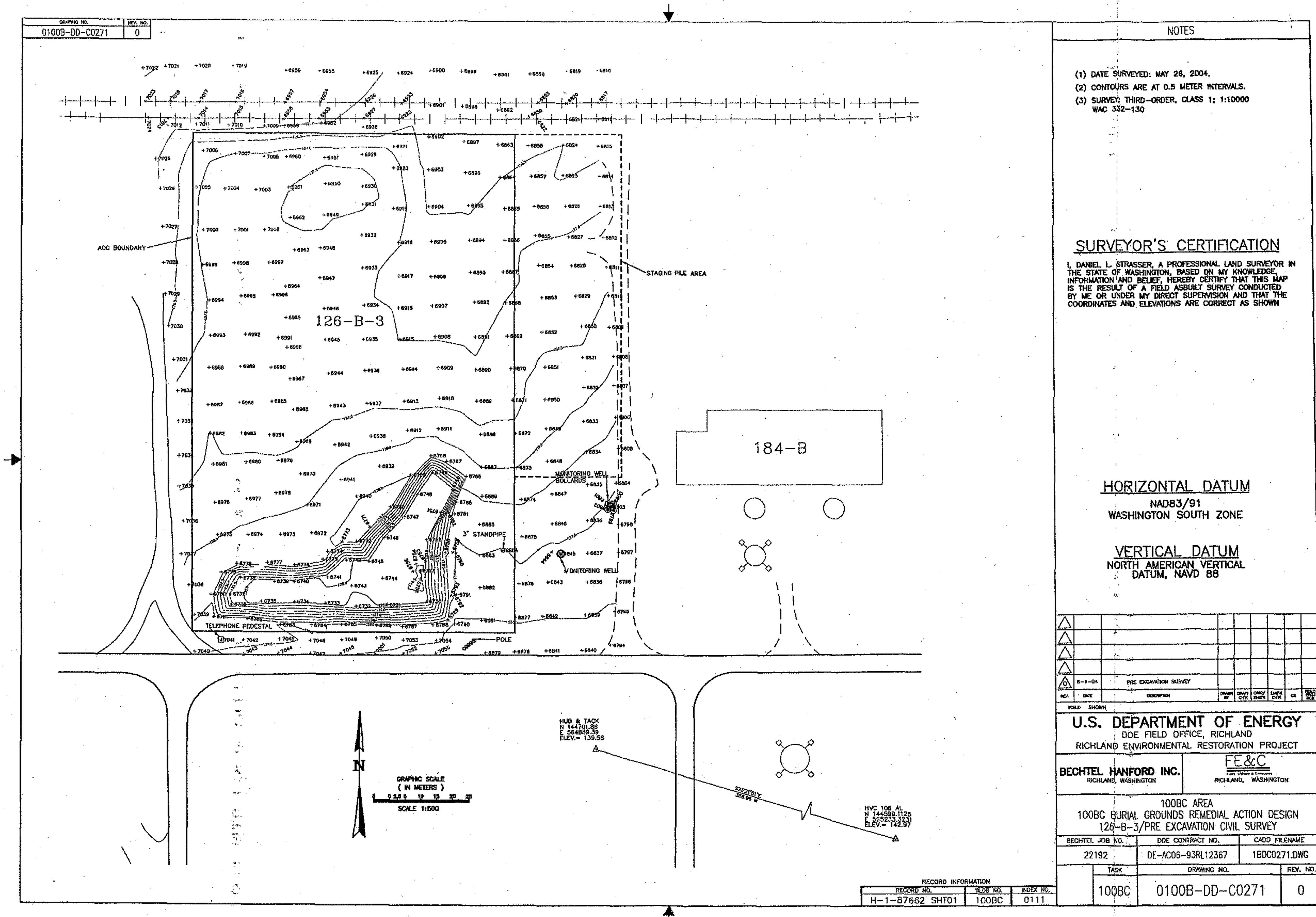
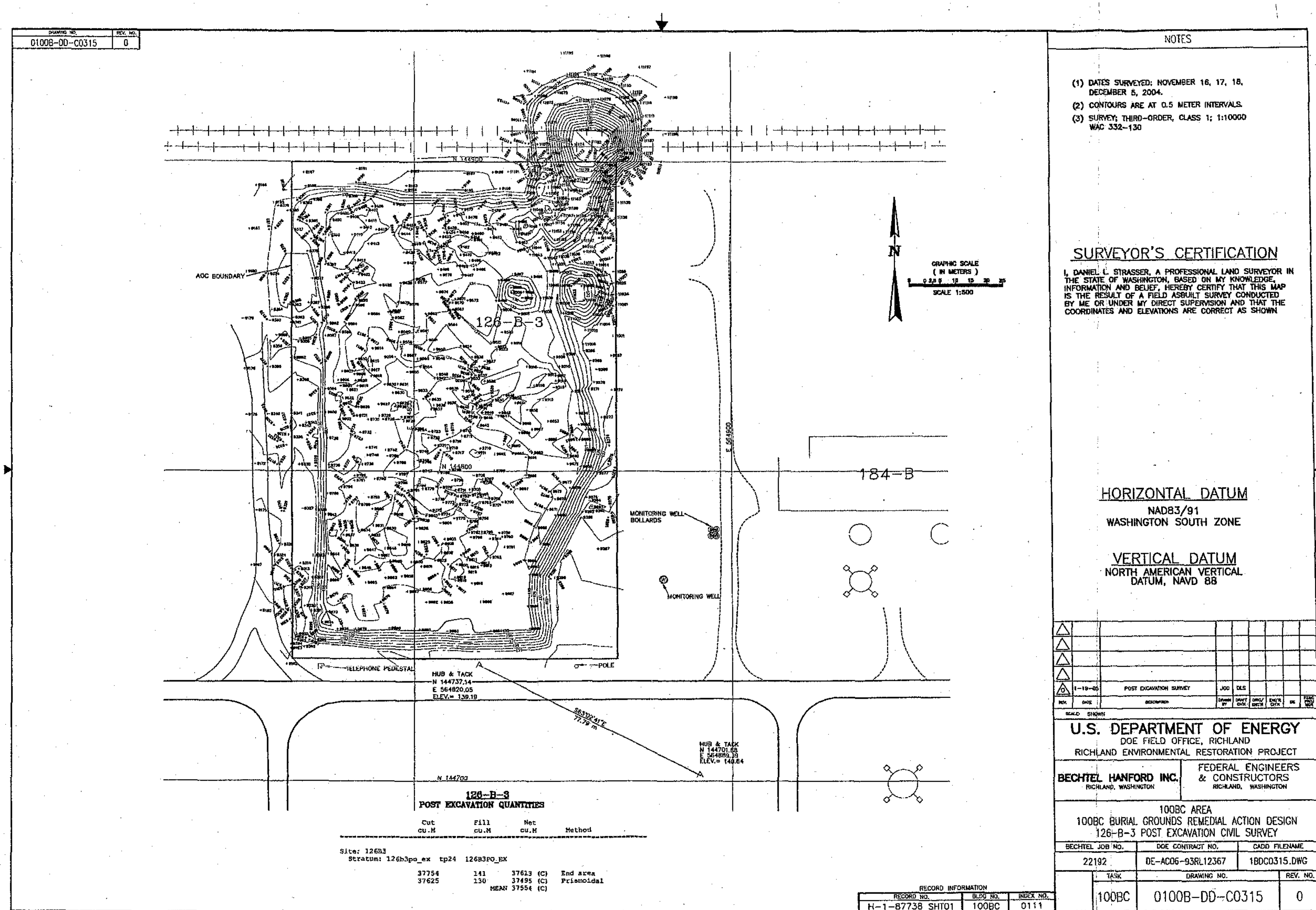


Figure 6. Post-Excavation Civil Survey of the 126-B-3, 184-B Coal Pit Dumping Area.



5.0 VERIFICATION SAMPLE DESIGN

This section describes the requirements for verification sampling and analysis to support closeout of the site. The verification sampling will be performed to support a determination that the residual soil at the 126-B-3 Coal Pit Dumping Area waste site meets the cleanup criteria specified in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b) and the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (EPA 1999).

5.1 Contaminants of Concern

The results of the confirmatory sampling and waste characterization sampling were used to develop the contaminants of concern (COCs) for verification sampling. These COCs include the constituents that were detected in the confirmatory samples and waste characterization samples excluding radionuclides that were not present above cleanup levels. The COCs for site verification sampling are summarized in Table 2.

Table 2. Contaminants of Concern.

Metals	Pesticides	SVOCs	Other
Arsenic[a]	Aldrin[b]	Benzo(a)pyrene[b]	Total petroleum hydrocarbons[b]
Barium[b]	DDE[b]	Benzo(b)fluoranthene[a]	Asbestos
Cadmium[b]	DDT[b]	Benzo(k)fluoranthene[a]	Aroclor-1268 [c]
Lead[b]	Endosulfan sulfate[b]	Bis(2-ethylhexyl)phthalate[a]	
Mercury[b]	Endosulfan II[a]	Chrysene[b]	
Selenium[b]		Indeno(1,2,3-cd)pyrene[a]	
Silver[a]			

[a] Contaminant detected in soil samples but less than cleanup criteria.
[b] Contaminant detected in soil samples greater than cleanup criteria.
[c] Contaminant detected in waste sample.
SVOC = semivolatile organic compound

The laboratory detection limits for polychlorinated biphenyls (PCBs) and a few semivolatile organic compounds (SVOCs) were slightly greater than the cleanup criteria, and therefore these constituents will be carried forward as COPCs for the site. Additionally, because only *Resource Conservation and Recovery Act of 1976* (RCRA) metals were analyzed during the confirmatory sampling, the expanded inductively coupled plasma (ICP) metals list will be performed to evaluate the levels of non-RCRA metals (e.g., antimony, beryllium, boron, cobalt, copper, manganese, molybdenum, nickel, vanadium, and zinc). Radionuclides are eliminated as COCs for verification sampling because they were not detected in the confirmatory sampling results above background levels.

5.2 Sample Design Selection and Basis

This section describes the basis for selection of an appropriate sample design and determination of the number of verification samples to collect. The decision rule for demonstrating compliance with the cleanup criteria requires comparison of the true population mean, as estimated by the upper 95% confidence limit on the sample mean, with the cleanup level. Therefore, a statistical sampling design is the preferred verification sampling approach for this site because the distribution of potential residual soil contamination over the study area (site) is uncertain. The Washington State Department of Ecology (Ecology) publication *Guidance on Sampling and Data Analysis Methods* (Ecology 1995) recommends that systematic sampling with sample locations distributed over the entire study area be used. This sampling approach is known by Ecology as "area-wide sampling."

Visual Sampling Plan[1](VSP) was used as a tool to develop the statistical sampling design for the verification sampling. A pilot study was performed using TPH as an indicator compound to estimate the variability of residual contamination in the soil and support estimates of the standard deviation for use in VSP. On December 14, 2004, twenty systematically located soil samples for TPH analysis were collected on a triangular grid to provide an estimate of the standard deviation of TPH for use in VSP and to evaluate if the site was ready for collection of verification samples. The results for the 20 TPH samples are provided in Appendix C (Table C-5). This information was then used in VSP to develop the statistical verification sampling design described in Appendix D.

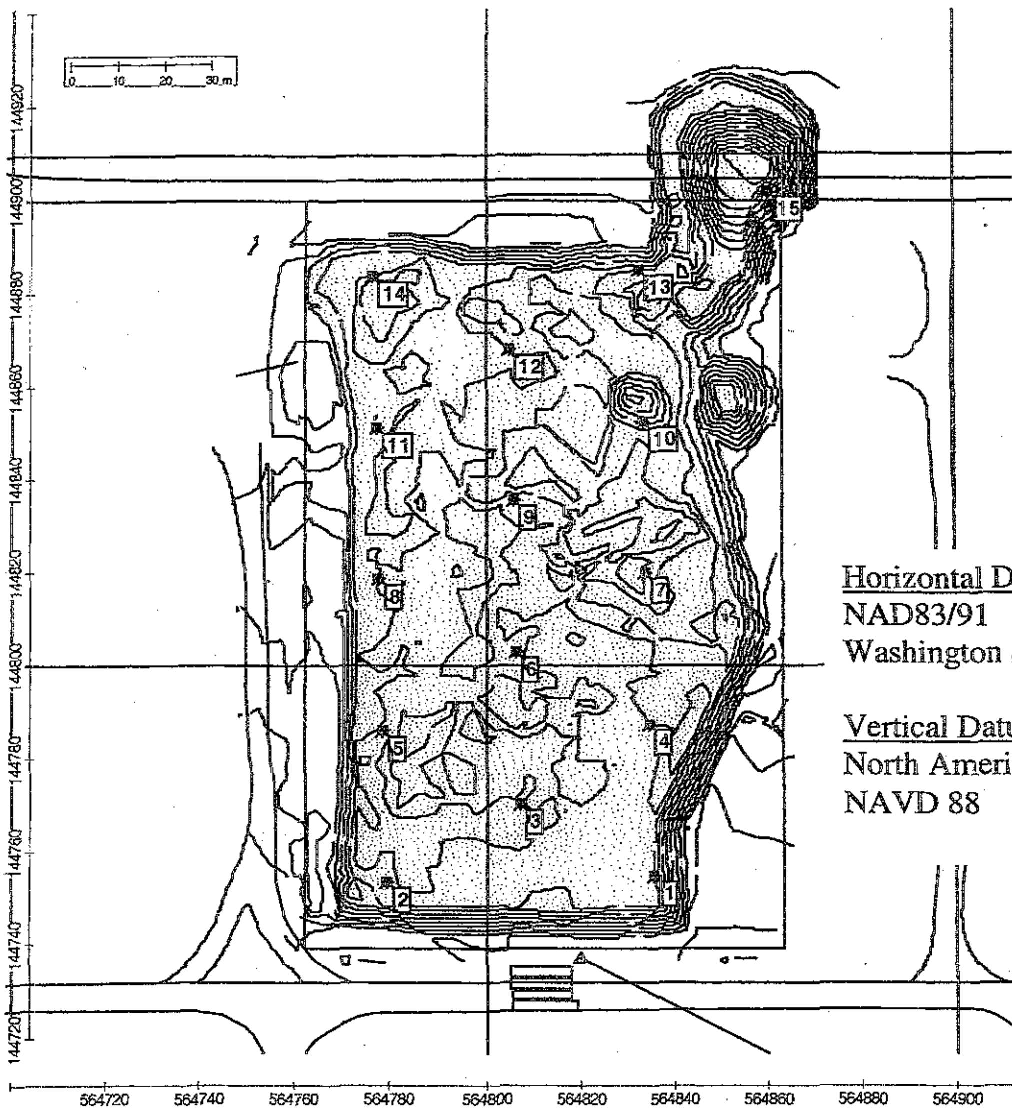
The post-excavation topographic survey drawing was used to determine the area of the decision unit requiring soil verification sampling. A review of the pre- and post-excavation drawings (Figures 5 and 6) indicated that selection of the 136.5-m elevation contour line and deeper as an approximate outer boundary for the decision unit (also known as the sample area) is appropriate. This area was delineated in VSP and used as the basis for location of a systematic grid for verification soil sample collection. A total of 15 soil samples will be collected on a random-start, triangular grid. A triangular grid was selected for this investigation based on studies that indicate triangular grids are superior to square grids (Gilbert 1987). Additional details concerning the use of VSP to develop the statistical sampling design and derive the number of verification samples to collect is discussed in Appendix D.

5.3 Field Sampling

Figure 7 provides a map of the 15 soil sample locations that will be collected for verification sampling. The soil sample locations will be global positional surveyed and staked prior to sample collection. All sampling will be performed in accordance with BHI-EE-01, *Environmental Investigations Procedures*. One soil sample will be collected at each location as a grab sample consisting of soil from the surface to a depth of approximately 0.15 m (6 in.). Each sample will be analyzed for the expanded ICP metals list (antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, nickel, selenium, vanadium, silver, and zinc), mercury, PCBs, TPHs, SVOCs, pesticides, and asbestos.

[1] Visual Sampling Plan is a site map-based user-interface program that may be downloaded at http://etd.pnl.gov:2080/DQO/software/vsp/vspbeta.html.

Figure 7. Proposed Verification Sampling Locations.



Horizontal Datum
NAD83/91
Washington South Zone

Vertical Datum
North American Vertical Datum
NAVD 88

One duplicate soil sample will be collected at a location selected at the discretion of the sampler. One equipment blank sample consisting of clean silica sand will be collected and analyzed for TPHs, ICP metals, mercury, PCBs, and SVOCs. All samples will be requested for full protocol laboratory analysis.

5.4 Data Quality Assessment

Post-data collection activities generally will follow those outlined in *Statistical Guidance for Ecology Site Managers* (Ecology 1992) and the U.S. Environmental Protection Agency's *Guidance for Data Quality Assessment* (EPA 2000). The data analyst will be familiar with the context of the site remedial action and goals for data collection and assessment. The data will be verified and validated before being subjected to statistical or other analyses. Graphical and analytical tools will be used to verify to the extent possible the assumptions of the statistical analyses that were performed as well as to achieve a general understanding of the verification sampling data. The data will be used to assess whether they are adequate in both quality and quantity to support the primary objective of demonstrating that the site meets the cleanup criteria. Because the primary objective is to compare the site mean value with threshold cleanup values, the data will be assessed in this context.

6.0 REFERENCES

Bergstrom, K. A. and T. J. Mitchell, 2003, *Results of Geophysical Investigation at Remaining Sites*, CNN 108137, dated June 25, 2003, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2003a, *Remaining Site Field Sampling*, Logbook EL-1577, pages 15 through 23, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2003b, *Waste Site Evaluation for 126-B-3 Dumping Area,* 0100B-CA-V0123, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2003c, *Waste Site Evaluation for 126-B-3 Dumping Area,* 0100B-CA-V0123, Rev. 1, Bechtel Hanford, Inc., Richland, Washington.

BHI-EE-01, *Environmental Investigations Procedures*, Bechtel Hanford, Inc., Richland, Washington.

DOE-RL, 2005a, *100 Area Remedial Action Sampling and Analysis Plan*, DOE/RL-96-22, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2005b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area,* DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, 1992, *Statistical Guidance for Ecology Site Managers,* Publication No. 92-54, Washington State Department of Ecology, Olympia, Washington.

Ecology, 1995, *Washington State Department of Ecology Toxics Cleanup Program – Guidance on Sampling and Data Analysis Methods*, Publication No. 94-49, Washington State Department of Ecology, Olympia, Washington.

EPA, 1999, *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

EPA, 2000, *Guidance for Data Quality Assessment*, EPA QA/G-9, EPA/600/R-96/084, U.S. Environmental Protection Agency, Washington, D.C.

Gilbert, R. O., 1987, *Statistical Methods for Environmental Pollution Monitoring*, Wiley & Sons, Inc., New York, New York.

Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901, et seq.

APPENDIX A

WASTE INFORMATION DATA SYSTEM GENERAL SUMMARY REPORT
(2 Pages)

Waste Information Data System General Summary Report

3/3/2003

Site Code:	126-B-3	**Site Classification:** Accepted	Page 1

Site Names:	126-B-3, 184-B Coal Pit		
Site Type:	Dumping Area	**Start Date:**	1943
Status:	Inactive	**End Date:**	1968
Operable Unit:	100-BC-1	**Coordinates:**	
Hanford Area:	100B	(E) 564798.5	
		(N) 144850.484	
		Washington State Plane	

Site Description: The unit is a pit originally excavated to store coal for use in the powerhouse from 1943 through 1968. After coal storage was discontinued, the site was used as a demolition landfill. Approximately 75% of this pit has been used for waste disposal and is covered with about 0.3 meters (1 foot) of pit run backfill material. As of 1995, the remaining 25% of this pit has been backfilled and the surface stabilized to match the surrounding grade.

Location Description: The site is located just west of the 184-B Power House (demolished) and northeast of the 182-B Pump House and Reservoir.

Process Description: The site was used for coal storage from 1943 to 1968. Beginning in the early to mid 1970's, the site was used as a dumping area (burial ground) for demolished 100B facilities. The 108-B building has been demolished. The decommissioning was completed in May 1985. All the above-grade portions of the building were demolished to a minimum of 3 meters (10 feet) below grade. The clean rubble and debris were disposed in the 184-B Coal Pit.

Associated Structures: The site was associated with the 184-B Power House.

Environmental Monitoring Description: Monthly environmental protection surveillances are performed. Waste disposal logs are maintained by Inactive Facility Surveillance and Maintenance.

References:

1. 11/30/90, WIDS Site Addition, 126-B-3.
2. S. K. Kiser, 9/88, Hanford Surplus Facilities Programs Facilities Listings and Descriptions, WHC-SP-0331.
3. D. G. Kachele, 5/13/86, 108-B Tritium Separation Facility Decontamination and Decommissioning Project Hanford Site, Individual Facility Report, UNI-3753.
4. R. H. Griffin, 4/21/93, WIDS Site Modification, Sites in 116-B-6A, 126-B-3, 116-C-3, 1607-B10, 1607-B11.
5. R. W. Carpenter, 05/18/94, 100-B Area Technical Baseline Report, WHC-SD-EN-TI-220.

Waste Information:

Type: Demolition and Inert Waste
Category: Nonhazardous/nonradioactive
Physical State: Solid
Start Date: 1975
Waste Obscured: Gravel/Cobble Overburden
Description: This unit contains waste from demolished 100-B Facilities. These include released portions of 108-B, 117-B, 117-C, 115-BC, and 184-B. This unit is likely to contain lead acid batteries. There are aluminum filter frames from the 117-B and 117-C Facilities on the surface on the south side. Steel staircases and ladders have been deposited on the surface on the northeast side of the site.
References:

1. 11/30/90, WIDS Site Addition, 126-B-3.
2. R. W. Carpenter, 05/18/94, 100-B Area Technical Baseline Report, WHC-SD-EN-TI-220.

Dimensions:

Length:	121.92 Meters	400.00 Feet
Width:	68.58 Meters	225.00 Feet

Depth / Height:	3.05	Meters	10.00	Feet
Sq. Area:	8,361.27	sqMeters	89,999.91	sqFeet

Comment: According to the original WIDS Site Addition, the length and width values are approximate.

References:
1. 11/30/90, WIDS Site Addition, 126-B-3.
2. Shearer, Jeffrey P. with Roger W. Carpenter, 4/4/96, Depth of 100BC Sites.

Regulatory Information

Programmatic Responsibility

DOE Program: EM-40 **Confirmed By Program:** Yes
DOE Division: ERD - Environmental Restoration Division
Responsible Contractor/Subcontractor: BHI. Bechtel Hanford, Inc.

Site Evaluation

Solid Waste Management Unit: Yes
TPA Waste Management Unit Type: Waste Disposal Unit

Permitting

RCRA Part A Permit: No
RCRA Part B Permit: No
RCRA Permit Status:

Closure Plan: No
TSD Number:

Septic Permit: No
Inert Landfill: No
Air Operating Permit: No

216/218 Permit: No
NPDES: No
State Waste Discharge Permit: No

Air Operating Permit Number(s):

Tri-Party Agreement

Lead Regulatory Agency: EPA
Unit Category: CERCLA Past Practice (CPP)
TPA Appendix: C

Remediation and Closure

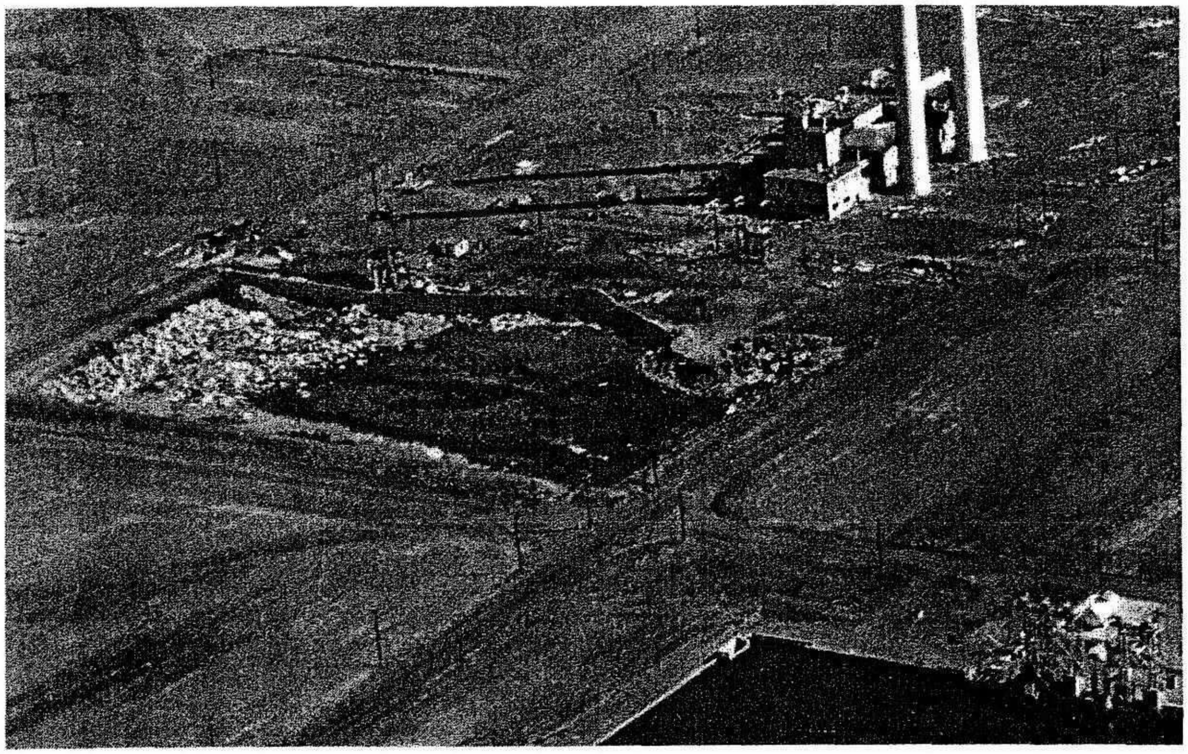
Decision Document: Interim Action Record of Decision, 100 Area Remaining Sites (1999)
Decision Document Status: Final
Remediation Design Group: Group 5
Closure Document:
Closure Type:

Post Closure Requirements:

Residual Waste:

APPENDIX B

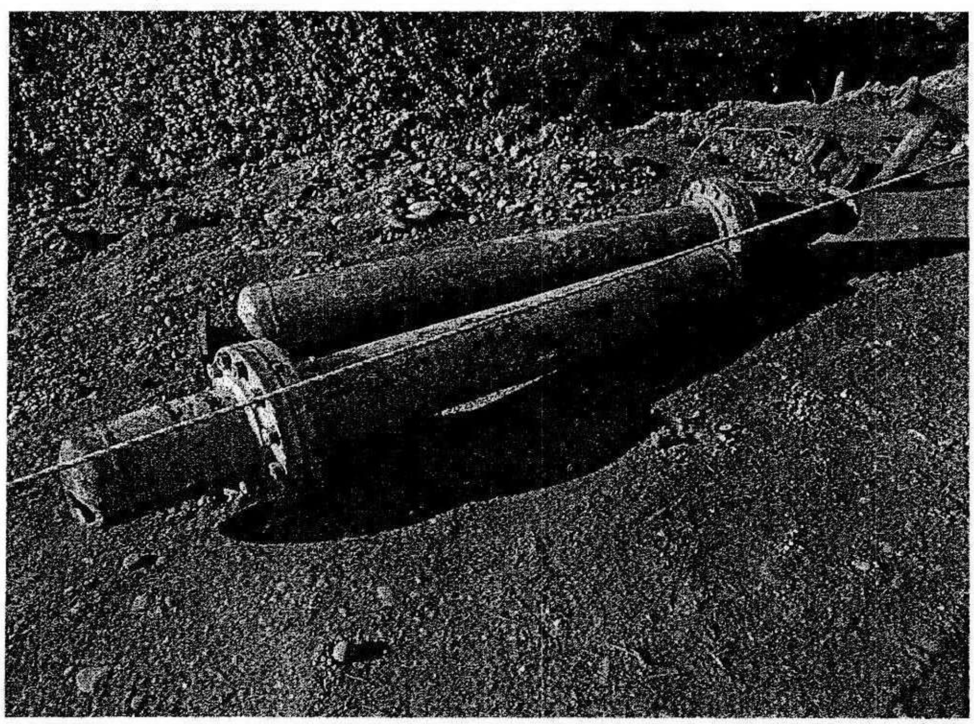
SITE PHOTOGRAPHS



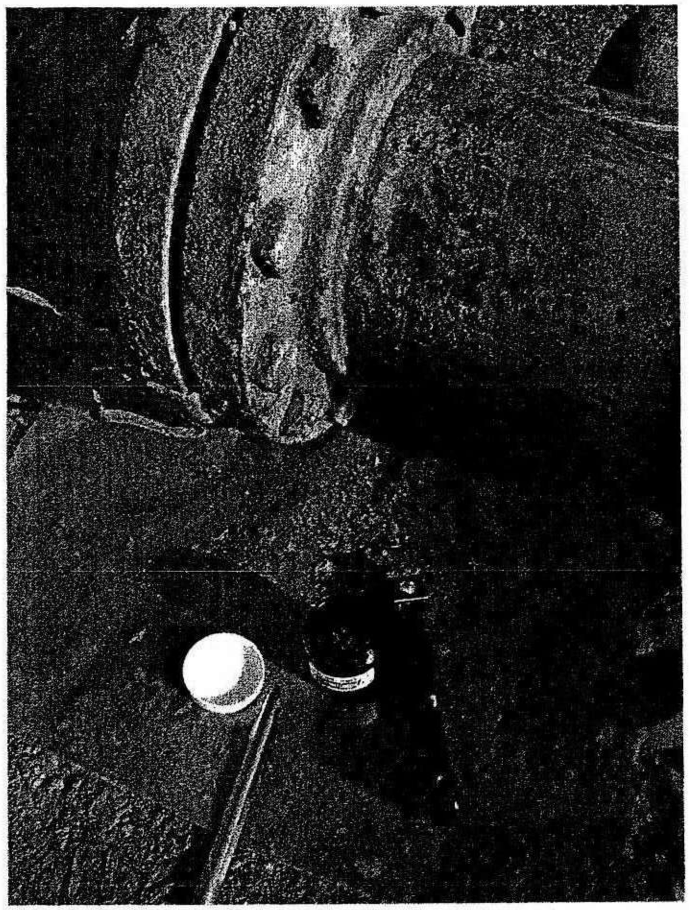
Photograph B.1. The 184-B Powerhouse and 184-B Coal Pit (126-B-3) used for disposal of demolition debris is shown in the photo. Burning can be seen at the upper right corner of the site.

Photograph B.2. Excavated soil and debris removed from 126-B-3 and staged for disposal.

Photograph B.3. Batteries located at the 126-B-3 site.



Photograph B.4. Pink and yellow paint coatings on metal debris.



Photograph B.5. Collection of paint sample from debris.

Photograph B.5. Metal debris with pink and yellow paint coatings.

APPENDIX C

126-B-3 COAL PIT DUMPING AREA SAMPLE RESULTS FROM PREVIOUS SAMPLING

Table C-1. Confirmatory Sampling Results. (10 Pages)

Sample Location	HEIS Number	Sample Date	Americium-241			Americium-241 GEA			Cesium-137			Cobalt-60			Europium-152			Europium-154		
			pCi/g	Q	MDA	pCi/g	Q	pCi/g	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Test Pit 6 ash	J00JJ7	03/21/03				0.075	U	0.075	0.048	U	0.048	0.02	U	0.02	0.055	U	0.055	0.057	U	0.057
Duplicate of J00JJ7	J00JJ8	03/21/03				0.28	U	0.28	0.041	U	0.041	0.024	U	0.024	0.073	U	0.073	0.099	U	0.099
Test Pit 6 Soil	J00JK0	03/21/03				0.032	U	0.032	0.023	U	0.023	0.025	U	0.025	0.053	U	0.053	0.082	U	0.082
Test Pit 4 Gasket	J00JM6	03/24/03				0.11	U	0.11	0.048	U	0.048	0.067	U	0.067	0.13	U	0.13	0.15	U	0.15
Test Pit 5 Soil	J00JR7	03/21/03				0.2	U	0.2	0.072	U	0.072	0.083	U	0.083	0.2	U	0.2	0.31	U	0.31
Test Pit 3 Soil	J00JR8	03/21/03				0.18	U	0.18	0.071	U	0.071	0.068	U	0.068	0.18	U	0.18	0.23	U	0.23
Test Pit 4 Soil	J00JR9	03/24/03				0.11	U	0.11	0.057		0.051	0.065	U	0.065	0.11	U	0.11	0.15	U	0.15
Test Pit 1 Soil	J00JT3	03/24/03				0.12	U	0.12	0.055	U	0.055	0.071	U	0.071	0.14	U	0.14	0.17	U	0.17
Test Pit 2 Soil	J00JT4	03/24/03				0.18	U	0.18	0.032	U	0.032	0.034	U	0.034	0.079	U	0.079	0.095	U	0.095
Duplicate of J00JT4	J00JT5	03/24/03				0.15	U	0.15	0.039		0.028	0.03	U	0.03	0.062	U	0.062	0.083	U	0.083
Equipment Blank	J00JT6	03/21/03	0	U	0.22	0.085	U	0.085	0.014	U	0.014	0.019	U	0.019	0.036	U	0.036	0.047	U	0.047

Sample Location	HEIS Number	Sample Date	Europium-155			Gross alpha			Gross beta			Nickel-63			Plutonium-238			Plutonium-239		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	PCi/g	Q	MDA	pCi/g	Q	MDA
Test Pit 6 ash	J00JJ7	03/21/03	0.056	U	0.056	1.02	U	2.7	-0.059	U	5.2									
Duplicate of J00JJ7	J00JJ8	03/21/03	0.095	U	0.095	1.93	U	2.6	3.29	U	5.5									
Test Pit 6 Soil	J00JK0	03/21/03	0.052	U	0.052	7.42		4.3	10.2		5.6									
Test Pit 4 Gasket	J00JM6	03/24/03	0.11	U	0.11	-3.91	U	12	6.65	U	7.6									
Test Pit 5 Soil	J00JR7	03/21/03	0.19	U	0.19	4.82		3.7	14.8		6.8									
Test Pit 3 Soil	J00JR8	03/21/03	0.17	U	0.17	1.61	U	3.9	13		6									
Test Pit 4 Soil	J00JR9	03/24/03	0.1	U	0.1	8.32		4.3	15.8		6.5									
Test Pit 1 Soil	J00JT3	03/24/03	0.13	U	0.13	8.75		4	20.3		5.3									
Test Pit 2 Soil	J00JT4	03/24/03	0.109	U	0.11	3.58		3.2	16.4		6.5									
Duplicate of J00JT4	J00JT5	03/24/03	0.087	U	0.087	7.58		3.7	13.8		8									
Equipment Blank	J00JT6	03/21/03	0.049	U	0.049	3.49		2.6	4.84	U	6.6	12.1	B	1.9	0.043	U	0.33	0.085	U	0.33

B = blank contamination
GEA = gamma energy analysis
HEIS = Hanford Environmental Information System
J = estimate
MDA = minimum detectable activity

PQL = practical quantification limit
TPH = total petroleum hydrocarbons
TCLP = Toxic Characteristic Leaching Procedure
Q = qualifier
U = undetected

Table C-1. Confirmatory Sampling Results. (10 Pages)

Sample Location	HEIS Number	Sample Date	Potassium-40			Radium-226			Radium-228			Technicium-99			Thorium-228 GEA			Thorium-232 GEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Test Pit 6 ash	J00JJ7	03/21/03	0.636		0.15	0.199		0.041	0.216		0.063				0.202		0.035	0.216		0.063
Duplicate of J00JJ7	J00JJ8	03/21/03	0.6	U	0.6	0.183		0.07	0.185		0.12				0.194		0.057	0.185		0.12
Test Pit 6 Soil	J00JK0	03/21/03	8.19		0.26	0.319		0.045	0.498		0.11				0.552		0.044	0.498		0.11
Test Pit 4 Gasket	J00JM6	03/24/03	0.8	U	0.8	0.092	U	0.092	0.22	U	0.22				0.064	U	0.064	0.22	U	0.22
Test Pit 5 Soil	J00JR7	03/21/03	8.81		0.94	0.268		0.16	0.275	U	0.28				0.328		0.091	0.275	U	0.28
Test Pit 3 Soil	J00JR8	03/21/03	8.24		0.63	0.339		0.14	0.684		0.24				0.4		0.072	0.684		0.24
Test Pit 4 Soil	J00JR9	03/24/03	8.72		0.31	0.358		0.084	0.432		0.19				0.44		0.055	0.432		0.19
Test Pit 1 Soil	J00JT3	03/24/03	9.64		0.64	0.357		0.09	0.573		0.25				0.656		0.088	0.573		0.25
Test Pit 2 Soil	J00JT4	03/24/03	13.7		0.24	0.482		0.056	0.785		0.13				0.668		0.033	0.785		0.13
Duplicate of J00JT4	J00JT5	03/24/03	12.4		0.2	0.463		0.047	0.793		0.096				0.068	U	0.068	0.793		0.096
Equipment Blank	J00JT6	03/21/03	4.48		0.13	0.134		0.026	0.226		0.06	0.07	U	0.5	0.152		0.018	0.226		0.06

Sample Location	HEIS Number	Sample Date	Total Radiostrontium			Tritium			Uranium-233/234			Uranium-235			Uranium-235 GEA			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Test Pit 6 ash	J00JJ7	03/21/03													0.075	U	0.075			
Duplicate of J00JJ7	J00JJ8	03/21/03													0.14	U	0.14			
Test Pit 6 Soil	J00JK0	03/21/03													0.083	U	0.083			
Test Pit 4 Gasket	J00JM6	03/24/03													0.18	U	0.18			
Test Pit 5 Soil	J00JR7	03/21/03				0.082	U	0.13	0.564		0.2	0.031	U	0.24	0.3	U	0.3	0.41		0.2
Test Pit 3 Soil	J00JR8	03/21/03				0.044	U	0.14	0.383		0.27	0.042	U	0.32	0.28	U	0.28	0.452		0.27
Test Pit 4 Soil	J00JR9	03/24/03				-0.012	U	0.15	0.331		0.25	0	U	0.31	0.16	U	0.16	0.562		0.25
Test Pit 1 Soil	J00JT3	03/24/03				-0.031	U	0.13	0.593		0.18	0.057	U	0.22	0.18	U	0.18	0.474		0.18
Test Pit 2 Soil	J00JT4	03/24/03				-0.069	U	0.14	0.428		0.2	0.162	U	0.25	0.13	U	0.13	0.375		0.2
Duplicate of J00JT4	J00JT5	03/24/03				-0.076	U	0.15	0.592		0.22	0.068	U	0.26	0.11	U	0.11	0.592		0.22
Equipment Blank	J00JT6	03/21/03	0.027	U	0.54				0.235		0.2	0	U	0.24	0.064	U	0.064	0.209		0.2

Table C-1. Confirmatory Sampling Results. (10 Pages)

Sample Location	HEIS Number	Sample Date	Arsenic			Barium			Cadmium			Chromium			Lead			Mercury		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Equipment Blank	J00JT6	3/21/2003	0.35	U	0.35	1.2		0.01	0.04	U	0.04	0.192		0.1	0.29		0.26	0.015	U	0
Test Pit 1 Soil	J00JT3	3/24/2003	4.7		0.37	75.8		0.01	0.042	U	0.04	11.7		0.1	8.9		0.28	0.017	U	0
Test Pit 2 Soil	J00JT4	3/24/2003	3.7		0.36	149		0.01	0.054		0.04	12		0.1	10		0.27	0.098		0
Duplicate of J00JT4	J00JT5	3/24/2003	3.8		0.37	140		0.01	0.054		0.04	12.4		0.1	9.9		0.28	0.092		0
Test Pit 3 Soil	J00JR8	3/21/2003	2.4		0.35	65.5		0.01	0.04	U	0.04	4.5		0.1	3.3		0.26	0.013	U	0
Test Pit 4 Soil	J00JR9	3/24/2003	12.3		0.33	89.2		0.01	0.279		0.04	14		0.1	15.1		0.24	0.807		0
Test Pit 4 Gasket	J00JM6	3/24/2003	170	C	0.28	0.97	C	0.01	8.7	C	0.03	4.8	C	0.1	1.2	U	1.2	0.08		0
Test Pit 5 Soil	J00JR7	3/21/2003	2.5		0.33	50.6		0.01	1.3		0.04	10.1		0.1	3.6		0.25	0.339		0
Test Pit 6 Ash	J00JJ7	3/21/2003	1		0.78	106		0.01	0.09	U	0.09	2.4		0.1	3.8		0.58	0.042		0
Duplicate of J00JJ7	J00JJ8	3/21/2003	0.83		0.79	99		0.01	0.09	U	0.09	2.8		0.1	4.7		0.58	0.018		0
Test Pit 6 Soil	J00JK0	3/21/2003	2.4		0.36	99.3		0.01	0.041	U	0.04	5.4		0.1	3.6		0.27	0.016	U	0

Sample Location	HEIS Number	Sample Date	Selenium			Silver			Total Petroleum Hydrocarbons		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Equipment Blank	J00JT6	3/21/2003	0.36	U	0.36	0.08	U	0.08			
Test Pit 1 Soil	J00JT3	3/24/2003	0.381	U	0.38	0.09	U	0.09	33.2		3.7
Test Pit 2 Soil	J00JT4	3/24/2003	0.37	U	0.37	0.08	U	0.08	227		3.6
Duplicate of J00JT4	J00JT5	3/24/2003	0.381	U	0.38	0.09	U	0.09	664		36.6
Test Pit 3 Soil	J00JR8	3/21/2003	0.36	U	0.36	0.08	U	0.08	44.4		3.5
Test Pit 4 Soil	J00JR9	3/24/2003	0.337	U	0.34	0.08	U	0.08	645		18.2
Test Pit 4 Gasket	J00JM6	3/24/2003	2.1	U	2.1	0.16		0.1			
Test Pit 5 Soil	J00JR7	3/21/2003	0.345	U	0.35	0.08	U	0.08	32.1		3.5
Test Pit 6 Ash	J00JJ7	3/21/2003	1.9		0.81	0.18	U	0.18	185		3.8
Duplicate of J00JJ7	J00JJ8	3/21/2003	1.8		0.8	0.18	U	0.18	181		3.8

Table C-1. Confirmatory Sampling Results. (10 Pages)

Constituent	J00JJ7 Test Pit 6 Ash Sample Date 03/21/03			J00JJ8 Duplicate of J00JJ7 Sample Date 03/21/03			J00JK0 Test Pit 6 Soil Sample Date 03/21/03			J00JM6 Test Pit 4 Gasket Sample Date 03/21/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs (Polychlorinated Biphenyls)												
Aroclor-1016	230	U	230	230	U	230	35	U	35	2000000	U	2000000
Aroclor-1221	460	U	460	460	U	460	70	U	70	4000000	U	4000000
Aroclor-1232	230	U	230	230	U	230	35	U	35	2000000	U	2000000
Aroclor-1242	230	U	230	230	U	230	35	U	35	2000000	U	2000000
Aroclor-1248	230	U	230	230	U	230	35	U	35	2000000	U	2000000
Aroclor-1254	230	U	230	230	U	230	35	U	35	2000000	U	2000000
Aroclor-1260	230	U	230	230	U	230	35	U	35	2000000	U	2000000
Aroclor-1268	230	U	230	230	U	230				10000000		2000000
Pesticides												
Aldrin	110	U	110	1200		110	1.8	U	1.8			
Alpha-BHC	110	U	110	110	U	110	1.8	U	1.8			
Alpha-Chlordane	110	U	110	110	U	110	1.8	U	1.8			
beta-1,2,3,4,5,6-Hexachlorocyclohexane	110	U	110	110	U	110	1.8	U	1.8			
Delta-BHC	110	U	110	110	U	110	1.8	U	1.8			
Dichlorodiphenyldichloroethane	230	U	230	230	U	230	3.5	U	3.5			
Dichlorodiphenyldichloroethylene	320		230	310		230	3.5	U	3.5			
Dichlorodiphenyltrichloroethane	230	U	230	230	U	230	3.5	U	3.5			
Dieldrin	230	U	230	230	U	230	3.5	U	3.5			
Endosulfan I	110	U	110	110	U	110	1.8	U	1.8			
Endosulfan II	230	U	230	230	U	230	3.5	U	3.5			
Endosulfan sulfate	230	U	230	230	U	230	3.5	U	3.5			
Endrin	230	U	230	230	U	230	3.5	U	3.5			
Endrin aldehyde	230	U	230	230	U	230	3.5	U	3.5			
Endrin ketone	230	U	230	230	U	230	3.5	U	3.5			
Gamma-BHC (Lindane)	110	U	110	110	U	110	1.8	U	1.8			
Gamma-Chlordane	110	U	110	110	U	110	1.8	U	1.8			
Heptachlor	110	U	110	110	U	110	1.8	U	1.8			
Heptachlor epoxide	110	U	110	110	U	110	1.8	U	1.8			
Methoxychlor	1100	U	1100	1100	U	1100	18	U	18			
Toxaphene	11000	U	11000	11000	U	11000	180	U	180			
SVOA (Semivolatile Organic Analytes)												
1,2,4-Trichlorobenzene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
1,2-Dichlorobenzene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
1,3-Dichlorobenzene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
1,4-Dichlorobenzene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2,4,5-Trichlorophenol	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
2,4,6-Trichlorophenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2,4-Dichlorophenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2,4-Dimethylphenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2,4-Dinitrophenol	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
2,4-Dinitrotoluene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2,6-Dinitrotoluene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2-Chloronaphthalene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2-Chlorophenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2-Methylnaphthalene	11000	U	11000	710	J	11000	1800	U	1800	5800	U	5800

Table C-1. Confirmatory Sampling Results. (10 Pages)

Constituent	J00JJ7 Test Pit 6 Ash Sample Date 03/21/03			J00JJ8 Duplicate of J00JJ7 Sample Date 03/21/03			J00JK0 Test Pit 6 Soil Sample Date 03/21/03			J00JM6 Test Pit 4 Gasket Sample Date 03/21/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
2-Methylphenol (cresol, o-)	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2-Nitroaniline	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
2-Nitrophenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
3+4 Methylphenol (cresol, m+p)	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
3,3'-Dichlorobenzidine	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
3-Nitroaniline	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
4,6-Dinitro-2-methylphenol	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
4-Bromophenylphenyl ether	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
4-Chloro-3-methylphenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
4-Chloroaniline	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
4-Chlorophenylphenyl ether	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
4-Nitroaniline	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
4-Nitrophenol	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
Acenaphthene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Acenaphthylene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Anthracene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Benzo(a)anthracene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Benzo(a)pyrene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Benzo(b)fluoranthene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Benzo(ghi)perylene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Benzo(k)fluoranthene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Bis(2-chloro-1-methylethyl)ether	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Bis(2-Chloroethoxy)methane	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Bis(2-chloroethyl) ether	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Bis(2-ethylhexyl) phthalate	11000	U	11000	11000	U	11000	1800	U	1800	990	J	5800
Butylbenzylphthalate	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Carbazole	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Chrysene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Di-n-butylphthalate	940	J	11000	650	J	11000	1800	U	1800	680	J	5800
Di-n-octylphthalate	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Dibenz[a,h]anthracene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Dibenzofuran	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Diethylphthalate	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Dimethyl phthalate	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Fluoranthene	11000	U	11000	630	J	11000	1800	U	1800	5800	U	5800
Fluorene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Hexachlorobenzene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Hexachlorobutadiene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Hexachlorocyclopentadiene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Hexachloroethane	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Indeno(1,2,3-cd)pyrene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Isophorone	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
N-Nitroso-di-n-dipropylamine	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
N-Nitrosodiphenylamine	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Naphthalene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Nitrobenzene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Pentachlorophenol	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
Phenanthrene	11000	U	11000	880	J	11000	1800	U	1800	5800	U	5800
Phenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Pyrene	11000	U	11000	710	J	11000	1800	U	1800	5800	U	5800

Table C-1. Confirmatory Sampling Results. (10 Pages)

Constituent	J00JR7 Test Pit 5 Soil Sample Date 03/21/03			J00JR8 Test Pit 3 Soil Sample Date 03/21/03			J00JR9 Test Pit 4 Soil Sample Date 03/24/03			J00JT3 Test Pit 1 Soil Sample Date 03/24/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs (Polychlorinated Biphenyls)												
Aroclor-1016	35	U	35	36	U	36	37	U	37	37	U	37
Aroclor-1221	70	U	70	71	U	71	73	U	73	75	U	75
Aroclor-1232	35	U	35	36	U	36	37	U	37	37	U	37
Aroclor-1242	35	U	35	36	U	36	37	U	37	37	U	37
Aroclor-1248	35	U	35	36	U	36	37	U	37	37	U	37
Aroclor-1254	35	U	35	36	U	36	37	U	37	37	U	37
Aroclor-1260	35	U	35	36	U	36	37	U	37	37	U	37
Aroclor-1268												
Pesticides												
Aldrin	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Alpha-BHC	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Alpha-Chlordane	2.456		1.8	1.8	U	1.8	4.02		1.8	1.9	U	1.9
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Delta-BHC	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Dichlorodiphenyldichloroethane	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.7	U	3.7
Dichlorodiphenyldichloroethylene	16.141		3.5	3.5	U	3.5	24.5		3.5	3.7	U	3.7
Dichlorodiphenyltrichloroethane	3.5	U	3.5	3.5	U	3.5	11.7		3.5	3.7	U	3.7
Dieldrin	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.7	U	3.7
Endosulfan I	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Endosulfan II	3.5	U	3.5	3.5	U	3.5	8.78		3.5	3.7	U	3.7
Endosulfan sulfate	3.5	U	3.5	3.5	U	3.5	14.6		3.5	3.7	U	3.7
Endrin	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.7	U	3.7
Endrin aldehyde	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.7	U	3.7
Endrin ketone	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.7	U	3.7
Gamma-BHC (Lindane)	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Gamma-Chlordane	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Heptachlor	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Heptachlor epoxide	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Methoxychlor	18	U	18	18	U	18	18	U	18	19	U	19
Toxaphene	180	U	180	180	U	180	180	U	180	190	U	190
SVOA (Semivolatile Organic Analytes)												
1,2,4-Trichlorobenzene	350	U	350	360	U	360	3700	U	3700	370	U	370
1,2-Dichlorobenzene	350	U	350	360	U	360	3700	U	3700	370	U	370
1,3-Dichlorobenzene	350	U	350	360	U	360	3700	U	3700	370	U	370
1,4-Dichlorobenzene	350	U	350	360	U	360	3700	U	3700	370	U	370
2,4,5-Trichlorophenol	880	U	880	890	U	890	9200	U	9200	940	U	940
2,4,6-Trichlorophenol	330	U	330	360	U	360	3700	U	3700	370	U	370
2,4-Dichlorophenol	350	U	350	360	U	360	3700	U	3700	370	U	370
2,4-Dimethylphenol	350	U	350	360	U	360	3700	U	3700	370	U	370
2,4-Dinitrophenol	880	U	880	890	U	890	9200	U	9200	940	U	940
2,4-Dinitrotoluene	350	U	350	360	U	360	3700	U	3700	370	U	370
2,6-Dinitrotoluene	350	U	350	360	U	360	3700	U	3700	370	U	370
2-Chloronaphthalene	330	U	330	360	U	360	3700	U	3700	370	U	370
2-Chlorophenol	350	U	350	360	U	360	3700	U	3700	370	U	370
2-Methylnaphthalene	21.122	J	350	360	U	360	3700	U	3700	370	U	370
2-Methylphenol (cresol, o-)	350	U	350	360	U	360	3700	U	3700	370	U	370

Table C-1. Confirmatory Sampling Results. (10 Pages)

Constituents	J00JR7 Test Pit 5 Soil Sample Date 03/21/03			J00JR8 Test Pit 3 Soil Sample Date 03/21/03			J00JR9 Test Pit 4 Soil Sample Date 03/24/03			J00JT3 Test Pit 1 Soil Sample Date 03/24/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
2-Nitroaniline	880	U	880	890	U	890	9200	U	9200	940	U	940
2-Nitrophenol	350	U	350	360	U	360	3700	U	3700	370	U	370
3+4 Methylphenol (cresol, m+p)	350	U	350	360	U	360	3700	U	3700	370	U	370
3,3'-Dichlorobenzidine	350	U	350	360	U	360	3700	U	3700	370	U	370
3-Nitroaniline	880	U	880	890	U	890	9200	U	9200	940	U	940
4,6-Dinitro-2-methylphenol	880	U	880	890	U	890	9200	U	9200	940	U	940
4-Bromophenylphenyl ether	350	U	350	360	U	360	3700	U	3700	370	U	370
4-Chloro-3-methylphenol	350	U	350	360	U	360	3700	U	3700	370	U	370
4-Chloroaniline	350	U	350	360	U	360	3700	U	3700	370	U	370
4-Chlorophenylphenyl ether	350	U	350	360	U	360	3700	U	3700	370	U	370
4-Nitroaniline	880	U	880	890	U	890	9200	U	9200	940	U	940
4-Nitrophenol	880	U	880	890	U	890	9200	U	9200	940	U	940
Acenaphthene	350	U	350	360	U	360	3700	U	3700	370	U	370
Acenaphthylene	350	U	350	360	U	360	3700	U	3700	370	U	370
Anthracene	350	U	350	360	U	360	3700	U	3700	370	U	370
Benzo(a)anthracene	350	U	350	360	U	360	381	J	3700	370	U	370
Benzo(a)pyrene	350	U	350	360	U	360	368	J	3700	370	U	370
Benzo(b)fluoranthene	350	U	350	360	U	360	279	J	3700	370	U	370
Benzo(ghi)perylene	350	U	350	360	U	360	216	J	3700	370	U	370
Benzo(k)fluoranthene	350	U	350	360	U	360	289	J	3700	370	U	370
Bis(2-chloro-1-methylethyl)ether	350	U	350	360	U	360	3700	U	3700	370	U	370
Bis(2-Chloroethoxy)methane	350	U	350	360	U	360	3700	U	3700	370	U	370
Bis(2-chloroethyl) ether	350	U	350	360	U	360	3700	U	3700	370	U	370
Bis(2-ethylhexyl) phthalate	64.207	J	350	46.87	J	360	340	J	3700	49.256	J	370
Butylbenzylphthalate	350	U	350	360	U	360	3700	U	3700	370	U	370
Carbazole	350	U	350	360	U	360	3700	U	3700	370	U	370
Chrysene	350	U	350	360	U	360	560	J	3700	370	U	370
Di-n-butylphthalate	350	U	350	360	U	360	603	J	3700	370	U	370
Di-n-octylphthalate	350	U	350	360	U	360	3700	U	3700	370	U	370
Dibenz[a,h]anthracene	350	U	350	360	U	360	3700	U	3700	370	U	370
Dibenzofuran	350	U	350	360	U	360	3700	U	3700	370	U	370
Diethylphthalate	350	U	350	360	U	360	3700	U	3700	370	U	370
Dimethyl phthalate	350	U	350	360	U	360	3700	U	3700	370	U	370
Fluoranthene	350	U	350	360	U	360	884	J	3700	370	U	370
Fluorene	350	U	350	360	U	360	3700	U	3700	370	U	370
Hexachlorobenzene	350	U	350	360	U	360	3700	U	3700	370	U	370
Hexachlorobutadiene	350	U	350	360	U	360	3700	U	3700	370	U	370
Hexachlorocyclopentadiene	330	U	330	360	U	360	3700	U	3700	370	U	370
Hexachloroethane	350	U	350	360	U	360	3700	U	3700	370	U	370
Indeno(1,2,3-cd)pyrene	350	U	350	360	U	360	246	J	3700	370	U	370
Isophorone	350	U	350	360	U	360	3700	U	3700	370	U	370
N-Nitroso-di-n-dipropylamine	350	U	350	360	U	360	3700	U	3700	370	U	370
N-Nitrosodiphenylamine	350	U	350	360	U	360	3700	U	3700	370	U	370
Naphthalene	350	U	350	360	U	360	3700	U	3700	370	U	370
Nitrobenzene	350	U	350	360	U	360	3700	U	3700	370	U	370
Pentachlorophenol	880	U	880	890	U	890	9200	U	9200	940	U	940
Phenanthrene	350	U	350	360	U	360	914	J	3700	370	U	370
Phenol	350	U	350	360	U	360	3700	U	3700	370	U	370
Pyrene	350	U	350	360	U	360	1041	J	1041.453	370	U	370

Table C-1. Confirmatory Sampling Results. (10 Pages)

Constituent	J00JT4 Test Pit 2 Soil Sample Date 03/24/03			J00JT5 Duplicate of J00JT4 Sample Date 03/24/03			J00JT6 Equipment Blank Sample Date 03/21/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs (Polychlorinated Biphenyls)									
Aroclor-1016	37	U	37	37	U	37			
Aroclor-1221	73	U	73	73	U	73			
Aroclor-1232	37	U	37	37	U	37			
Aroclor-1242	37	U	37	37	U	37			
Aroclor-1248	37	U	37	37	U	37			
Aroclor-1254	37	U	37	37	U	37			
Aroclor-1260	37	U	37	37	U	37			
Aroclor-1268									
Pesticides									
Aldrin	1.8	U	1.8	1.8	U	1.8			
Alpha-BHC	1.8	U	1.8	1.8	U	1.8			
alpha-Chlordane	1.8	U	1.8	1.8	U	1.8			
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.8	U	1.8	1.8	U	1.8			
Delta-BHC	1.8	U	1.8	1.8	U	1.8			
Dichlorodiphenyldichloroethane	3.5	U	3.5	3.5	U	3.5			
Dichlorodiphenyldichloroethylene	7.697		3.5	7.709		3.5			
Dichlorodiphenyltrichloroethane	3.5	U	3.5	3.5	U	3.5			
Dieldrin	3.5	U	3.5	3.5	U	3.5			
Endosulfan I	1.8	U	1.8	1.8	U	1.8			
Endosulfan II	3.5	U	3.5	3.5	U	3.5			
Endosulfan sulfate	3.5	U	3.5	3.5	U	3.5			
Endrin	3.5	U	3.5	3.5	U	3.5			
Endrin aldehyde	3.5	U	3.5	3.5	U	3.5			
Endrin ketone	3.5	U	3.5	3.5	U	3.5			
Gamma-BHC (Lindane)	1.8	U	1.8	1.8	U	1.8			
gamma-Chlordane	1.8	U	1.8	1.8	U	1.8			
Heptachlor	1.8	U	1.8	1.8	U	1.8			
Heptachlor epoxide	1.8	U	1.8	1.8	U	1.8			
Methoxychlor	18	U	18	18	U	18			
Toxaphene	180	U	180	180	U	180			
SVOA (Semivolatile Organic Analytes)									
1,2,4-Trichlorobenzene	3700	U	3700	3700	U	3700	330	U	330
1,2-Dichlorobenzene	3700	U	3700	3700	U	3700	330	U	330
1,3-Dichlorobenzene	3700	U	3700	3700	U	3700	330	U	330
1,4-Dichlorobenzene	3700	U	3700	3700	U	3700	330	U	330
2,4,5-Trichlorophenol	9200	U	9200	9200	U	9200	840	U	840
2,4,6-Trichlorophenol	3700	U	3700	3700	U	3700	330	U	330
2,4-Dichlorophenol	3700	U	3700	3700	U	3700	330	U	330
2,4-Dimethylphenol	3700	U	3700	3700	U	3700	330	U	330
2,4-Dinitrophenol	9200	U	9200	9200	U	9200	840	U	840
2,4-Dinitrotoluene	3700	U	3700	3700	U	3700	330	U	330
2,6-Dinitrotoluene	3700	U	3700	3700	U	3700	330	U	330
2-Chloronaphthalene	3700	U	3700	3700	U	3700	330	U	330
2-Chlorophenol	3700	U	3700	3700	U	3700	330	U	330
2-Methylnaphthalene	3700	U	3700	3700	U	3700	330	U	330
2-Methylphenol (cresol, o-)	3700	U	3700	3700	U	3700	330	U	330

Table C-1. Confirmatory Sampling Results. (10 Pages)

Constituent	J00JT4 Test Pit 2 Soil Sample Date 03/24/03			J00JT5 Duplicate of J00JT4 Sample Date 03/24/03			J00JT6 Equipment Blank Sample Date 03/21/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
2-Nitroaniline	9200	U	9200	9200	U	9200	840	U	840
2-Nitrophenol	3700	U	3700	3700	U	3700	330	U	330
3+4 Methylphenol (cresol, m+p)	3700	U	3700	3700	U	3700	330	U	330
3,3'-Dichlorobenzidine	3700	U	3700	3700	U	3700	330	U	330
3-Nitroaniline	9200	U	9200	9200	U	9200	840	U	840
4,6-Dinitro-2-methylphenol	9200	U	9200	9200	U	9200	840	U	840
4-Bromophenylphenyl ether	3700	U	3700	3700	U	3700	330	U	330
4-Chloro-3-methylphenol	3700	U	3700	3700	U	3700	330	U	330
4-Chloroaniline	3700	U	3700	3700	U	3700	330	U	330
4-Chlorophenylphenyl ether	3700	U	3700	3700	U	3700	330	U	330
4-Nitroaniline	9200	U	9200	9200	U	9200	840	U	840
4-Nitrophenol	9200	U	9200	9200	U	9200	840	U	840
Acenaphthene	3700	U	3700	3700	U	3700	330	U	330
Acenaphthylene	3700	U	3700	3700	U	3700	330	U	330
Anthracene	3700	U	3700	3700	U	3700	330	U	330
Benzo(a)anthracene	3700	U	3700	3700	U	3700	330	U	330
Benzo(a)pyrene	3700	U	3700	3700	U	3700	330	U	330
Benzo(b)fluoranthene	3700	U	3700	3700	U	3700	330	U	330
Benzo(ghi)perylene	3700	U	3700	3700	U	3700	330	U	330
Benzo(k)fluoranthene	3700	U	3700	3700	U	3700	330	U	330
Bis(2-chloro-1-methylethyl)ether	3700	U	3700	3700	U	3700	330	U	330
Bis(2-Chloroethoxy)methane	3700	U	3700	3700	U	3700	330	U	330
Bis(2-chloroethyl) ether	3700	U	3700	3700	U	3700	330	U	330
Bis(2-ethylhexyl) phthalate	3700	U	3700	3700	U	3700	31.8	J	330
Butylbenzylphthalate	3700	U	3700	3700	U	3700	330	U	330
Carbazole	3700	U	3700	3700	U	3700	330	U	330
Chrysene	3700	U	3700	3700	U	3700	330	U	330
Di-n-butylphthalate	3700	U	3700	3700	U	3700	332		330
Di-n-octylphthalate	3700	U	3700	3700	U	3700	330	U	330
Dibenz[a,h]anthracene	3700	U	3700	3700	U	3700	330	U	330
Dibenzofuran	3700	U	3700	3700	U	3700	330	U	330
Diethylphthalate	3700	U	3700	3700	U	3700	17.9	J	330
Dimethyl phthalate	3700	U	3700	3700	U	3700	330	U	330
Fluoranthene	3700	U	3700	3700	U	3700	330	U	330
Fluorene	3700	U	3700	3700	U	3700	330	U	330
Hexachlorobenzene	3700	U	3700	3700	U	3700	330	U	330
Hexachlorobutadiene	3700	U	3700	3700	U	3700	330	U	330
Hexachlorocyclopentadiene	3700	U	3700	3700	U	3700	330	U	330
Hexachloroethane	3700	U	3700	3700	U	3700	330	U	330
Indeno(1,2,3-cd)pyrene	3700	U	3700	3700	U	3700	330	U	330
Isophorone	3700	U	3700	3700	U	3700	330	U	330
N-Nitroso-di-n-dipropylamine	3700	U	3700	3700	U	3700	330	U	330
N-Nitrosodiphenylamine	3700	U	3700	3700	U	3700	330	U	330
Naphthalene	3700	U	3700	3700	U	3700	330	U	330
Nitrobenzene	3700	U	3700	3700	U	3700	330	U	330
Pentachlorophenol	9200	U	9200	9200	U	9200	840	U	840
Phenanthrene	3700	U	3700	3700	U	3700	330	U	330
Phenol	3700	U	3700	3700	U	3700	330	U	330
Pyrene	3700	U	3700	3700	U	3700	330	U	330

Table C-1. Confirmatory Sampling Asbestos Results. (10 Pages)

Sample Location	HEIS Number	Sample Date	Asbestos Result
Test Pit 1 Soil	J00JV3	03/24/03	None
Test Pit 2 Soil	J00V4	03/24/03	Trace
Duplicate of J00V4	J00JV5	03/24/03	Obvious
Test Pit 3 Soil	J00JM1	03/21/03	None
Test Pit 4 Soil	J00JV2	03/24/03	Obvious
Test Pit 4 Gasket	J00JN9	03/21/03	None
Test Pit 5 Soil	J00JM0	03/21/03	None
Test Pit 5 Fire Brick	J00JN8	03/21/03	None
Test Pit 6 Ash	J00JK2	03/21/03	Obvious
Duplicate of J00JK2	J00JK3	03/21/03	Significant
Test Pit 6 Soil	J00JK4	03/21/03	Obvious
Test Pit 6 Debris (wool like)	J00JM2	03/21/03	Significant
Test Pit 6 Tar/mastic	J00JM3	03/21/03	None
Test Pit 6 Pipe Lagging	J00JM4	03/21/03	Significant
Test Pit 6 (refractory brick)	J00JM5	03/21/03	Significant

Table C-2. Confirmatory Sampling Results – Additional Waste Characterization (TCLP Metals, Cyanide and Sulfide).

			TCLP Metals																							
Sample Location	HEIS Number	Sample Date	Arsenic			Barium			Cadmium			Chromium			Lead			Mercury			Selenium			Silver		
			ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL
Test Pit 6 Ash	J00JJ7	03/21/03	21	U	21	300		0.6	2.4	U	2.4	3.6	U		15.6	U	15.6	0.1	U	0.1	21.6	U	21.6	4.8	U	4.8
Duplicate of J00JJ7	J00JJ8	03/21/03	21	U	21	172		0.6	2.4	U	2.4	3.6	U		15.6	U	15.6	0.1	U	0.1	21.6	U	21.6	4.8	U	4.8
Test Pit 4 Gasket	J00JM6	03/24/03	50.4	U	50.4	35.2		5.6	4.7	U	4.7	7.9	U		38.5	U	38.5	0.1	U	0.1	70.3	U	70.3	6.3	U	6.3

Sample Location	HEIS Number	Sample Date	Cyanide			Sulfide		
			mg/kg	Q	PQL	mg/kg	Q	PQL
Test Pit 2 Soil	J00JT4	03/24/03	0.55	U	0.55	20	U	20
Duplicate of J00JT4	J00JT5	03/24/03	0.55	U	0.55	23.7	U	23.7
Test Pit 4 Soil	J00JR9	03/24/03	0.51	U	0.51	19.3	U	19.3
Test Pit 4 Gasket	J00JM6	03/24/03	1.87	U	1.87	162	U	162
Test Pit 6 Ash	J00JJ7	03/21/03	0.57	U	0.57	43	U	43
Duplicate of J00JJ7	J00JJ8	03/21/03	0.46	U	0.46	44.6	U	44.6

Table C-2. Confirmatory Sampling Results – Additional Waste Characterization (TCLP SVOA).

Sample Location	HEIS Number	Sample Date	1,4-Dichlorobenzene			2,4,5-Trichlorophenol			2,4,6-Trichlorophenol			2,4-Dinitrotoluene			2-Methylphenol (cresol, o-)			3+4 Methylphenol (cresol, m+p)		
			ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL
Test Pit 6 Ash	J00JJ7	03/21/03	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05
Duplicate of J00JJ7	J00JJ8	03/21/03	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05
Test Pit 4 Gasket	J00JM6	03/24/03	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05
Test Pit 4 Soil	J00JR9	03/24/03	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05
Test Pit 2 Soil	J00JT4	03/24/03	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05
Duplicate of J00JT4	J00JT5	03/24/03	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05

Sample Location	HEIS Number	Sample Date	Hexachlorobenzene			Hexachlorobutadiene			Hexachlorethane			Nitrobenzene			Pentachlorophenol			Pryidine		
			ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL
Test Pit 6 Ash	J00JJ7	03/21/03	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05
Duplicate of J00JJ7	J00JJ8	03/21/03	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05
Test Pit 4 Gasket	J00JM6	03/24/03	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05
Test Pit 4 Soil	J00JR9	03/24/03	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05
Test Pit 2 Soil	J00JT4	03/24/03	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05
Duplicate of J00JT4	J00JT5	03/24/03	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05

Table C-3. Waste Characterization Samples Collected During Excavation.

Sample Media	HEIS Number	Sample Date	Arsenic			Barium			Cadmium			Chromium			Lead			Mercury			Selenium			Silver		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Pink Paint	J00YB7	09/17/03	2.6	U	2.6	7760	C	0.12	5.1		0.25	4960	C	0.61	30800	C	1.2				3.7		1.8	1.2		0.49
Yellow Paint	J00YB8	09/17/03	4.3		23.6	160	C	0.12	3.6		0.25	24200	C	2.5	129000	C	4.7				1.8	U	1.8	1		0.49
Paint	J01786	01/22/04	7.8		0.28	187		2.1	3.6		0.25	20800		0.31	74100		1.3	10.4		0.18	2.1	U	2.1	0.94		0.38
Soil below batteries	J01YT4	10/28/04	6.2		0.35	127		0.01	0.03	U	0.03	11.3		0.06	7.9		0.26	0.02	U	0.02	0.36	U	0.36	0.1	U	0.1

Sample Type	HEIS Number	Sample Date	TCLP Arsenic			TCLP Barium			TCLP Cadmium			TCLP Chromium			TCLP] Lead			TCLP Mercury			TCLP Selenium			TCLP Silver		
			ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL	ug/ml	Q	PQL
Paint	J01786	01/22/04	19.7		17	812		1	122		2	298		2.5	12500		10	1	U	1	17	U	17	3	U	3

Table C-4. TPH Results for Excavation Guidance.

Sample Location	HEIS Number	Sample Date	Total Petroleum Hydrocarbons		
			mg/kg	Q	PQL
126-B-3	J024M0	11/29/04	881		35
126-B-3	J024M1	11/29/04	35.4	U	35.4
126-B-3	J024M2	11/29/04	34.2	U	34.2
126-B-3	J024M3	11/29/04	34.3	U	34.3
126-B-3	J024M4	11/29/04	34.2	U	34.2
126-B-3	J024M5	11/29/04	36.4	U	36.4

Table C-5. TPH Results for Pilot Study.

Sample Coordinates		HEIS Number	Sample Date	Total petroleum hydrocarbons (mg/kg)	Q	PQL
Easting	Northing					
564805.2170	144752.1303	J025R3	12/14/04	36.8	U	36.8
564827.1978	144767.9048	J025R4	12/15/04	36.2	U	36.2
564849.1787	144783.6793	J025R5	12/15/04	51.4		35
564780.5654	144763.2791	J025R6	12/15/04	34.6	U	34.6
564802.5463	144779.0536	J025R7	12/15/04	35	U	35
564824.5272	144794.8281	J025R8	12/15/04	37.2	U	37.2
564846.5080	144810.6026	J025R9	12/15/04	35.8	U	35.8
564777.8947	144790.2023	J025T0	12/15/04	35.8	U	35.8
564799.8756	144805.9768	J025T1	12/15/04	34.5	U	34.5
564821.8565	144821.7513	J025T2	12/15/04	35.7	U	35.7
564843.8373	144837.5259	J025T3	12/15/04	35	U	35
564775.2240	144817.1256	J025T4	12/15/04	36.1	U	36.1
564797.2049	144832.9001	J025T5	12/15/04	35.4	U	35.4
564819.1858	144848.6746	J025T6	12/15/04	35.2	U	35.2
564841.1667	144864.4491	J025T7	12/15/04	35.1	U	35.1
564772.5533	144844.0488	J025T8	12/15/04	35.3	U	35.3
564794.5342	144859.8233	J025T9	12/15/04	35	U	35
564816.5151	144875.5979	J025V0	12/15/04	35.7	U	35.7
564769.8826	144870.9721	J025V1	12/15/04	34.7	U	34.7
564791.8635	144886.7466	J025V2	12/15/04	35.7	U	35.7

APPENDIX D

SUMMARY OF STATISTICAL DESIGN FOR VERIFICATION SAMPING

APPENDIX D

SUMMARY OF STATISTICAL DESIGN FOR VERIFICATION SAMPLING

D.1 Summary

This appendix summarizes the sampling design used and associated statistical assumptions, as well as general guidelines to be used for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. Requirements for how to collect and analyze the samples are provided in Section 5.0 of the work instruction.

D.2 Primary Sampling Objective

The primary purpose of sampling at this site is to compare a site mean value with a fixed threshold. The decision rule for demonstrating compliance with the cleanup criteria requires comparison of the true population mean, as estimated by the upper 95% confidence limit on the sample mean, with the cleanup level (DOE-RL 2005). The working hypothesis (or "null" hypothesis) is that the mean value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the mean value is less than the threshold. Visual Sampling Plan[1] (VSP) calculates the number of samples required to reject the null hypothesis in favor of the alternative one, given a selected sampling approach and inputs to the associated equation.

D.3 Selected Sampling Approach

A nonparametric systematic sampling approach with a random start was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because the conceptual model and historical information (e.g., historical data from this site or a very similar site) indicate that typical parametric assumptions may not be true.

Both parametric and nonparametric equations rely on assumptions about the population. Typically, however, nonparametric equations require fewer assumptions and allow for more uncertainty about the statistical distribution of values at the site. The trade-off is that if the parametric assumptions are valid, the required number of samples is usually less than if a nonparametric equation was used.

---

[1] Visual Sampling Plan is a site map-based user-interface program that may be downloaded at http://etd.pnl.gov:2080/DQO/software/vsp/vspbeta.html.

The Washington State Department of Ecology publication *Guidance on Sampling and Data Analysis Methods* (Ecology 1995) recommends that systematic sampling with sample locations distributed over the entire study area be used. Therefore, a systematic grid sampling design with a random start was selected for use in VSP. Locating the sample points over a systematic grid with a random start ensures spatial coverage of the site. Statistical analyses of systematically collected data are valid if a random start to the grid is used. One disadvantage of systematically collected samples is that spatial variability or patterns may not be discovered if the grid spacing is large relative to the spatial patterns.

D.4 Number of Total Samples: Calculation Equation and Inputs

The equation used to calculate the number of samples is based on a Sign test (see Gilbert et al. 2001 for discussion). For this site, the null hypothesis is rejected in favor of the alternative one if the mean is sufficiently smaller than the threshold. The number of samples to collect is calculated so that if the inputs to the equation are true, the calculated number of samples will cause the null hypothesis to be rejected.

The formula used to calculate the number of samples is as follows:

$$n = 1.20\left[\frac{\left(Z_{1-\alpha} + Z_{1-\beta}\right)^2}{4(SignP - 0.5)^2}\right]$$

where

$$SignP = \Phi\left[\frac{\Delta}{\left(s^2_{sample} + \frac{s^2_{analytical}}{r}\right)^{1/2}}\right]$$

$\Phi(z)$	=	the cumulative standard normal distribution on $(-\infty, z)$ (see Gilbert et al. 2001 for details)
n	=	the number of samples
S	=	the estimated standard deviation of the measured values including analytical error
Δ	=	the width of the gray region
α	=	the acceptable probability of incorrectly concluding the site mean is less than the threshold
β	=	the acceptable probability of incorrectly concluding the site mean exceeds the threshold

$Z_{1-\alpha}$ = the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\alpha}$ is $1-\alpha$

$Z_{1-\beta}$ = the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\beta}$ is $1-\beta$.

NOTE: The *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* (EPA et al. 2000) suggests that the number of samples should be increased by at least 20% to account for missing or unusable data and uncertainty in the calculated value of *n*. VSP allows a user-supplied percent overage as discussed in MARSSIM (EPA et al. 2000, p. 5-33).

The values of these inputs that result in the calculated number of sampling locations are summarized in Table D-1.

Table D-1. VSP User Inputs.

Parameter	Value	Basis
S	3.6	Standard deviation for TPH based on pilot study soil sample results for the 126-B-3 site.
Δ	4	User defined conservative value set just below action level for TPH.
α	5%	False rejection rate specified in the DQO summary report (BHI 2003).
β	20%	False acceptance rate specified in the DQO summary report (BHI 2003).
$Z_{1-\alpha}$	1.64485	This value is automatically calculated by VSP based on the user-defined value of α.
$Z_{1-\beta}$	0.841621	This value is automatically calculated by VSP based on the user-defined value of β.
MARSSIM overage	20%	User-defined sample increase factor.

DQO = data quality objective
MARSSIM = *Multi-Agency Radiation Survey and Site Investigation Manual*
TPH = total petroleum hydrocarbon
VSP = Visual Sample Plan

In order to use VSP to calculate the appropriate number of samples, *n*, to collect for estimating the mean, it is necessary to have some prior estimate of the sample standard deviation. In general, estimates made from samples tend to more closely approximate the true population mean as the number of samples increases. For the 126-B-3 Coal Pit Dumping Area, the pilot study sampling data for total petroleum hydrocarbon (TPH) (Table C-5 of Appendix C) was used to estimate a standard deviation. Using this standard deviation of the pilot study samples for TPH and the applicable action level with associated "gray region" in VSP, the estimated number of verification samples to collect is 15.

Table D-2 summarizes the sampling design that was developed. Table D-3 lists sampling location coordinates. Figure D-1 shows sampling locations in the field.

Table D-2. Summary of Sampling Design.

Primary objective of design	Compare a site mean to a fixed threshold
Type of sampling design	Nonparametric
Sample placement (location) in the field	Systematic with a random start location
Working (null) hypothesis	The median (mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign test – MARSSIM version
Calculated total number of samples	15
Number of samples on map[a]	15
Number of selected sample areas[b]	1
Specified sampling area[c]	13794.57 m^2
Size of grid/area of grid cell[d]	32.59 m / 3017.2 m^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of (1) grid edge effects, (2) adding judgment samples, or (3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of shaded areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected shaded sample areas on the map of the site.
[d] Size of grid/area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.
MARSSIM = *Multi-Agency Radiation Survey and Site Investigation Manual*

Table D-3. 126-B-3 Verification Sample Location Coordinates.

Sample Location	X Coordinate	Y Coordinate	Type
1	564835.8	144755.1	Systematic
2	564779.4	144753.8	Systematic
3	564807.2	144770.7	Systematic
4	564835.0	144787.6	Systematic
5	564778.6	144786.3	Systematic
6	564806.4	144803.3	Systematic
7	564834.3	144820.2	Systematic
8	564777.8	144818.9	Systematic
9	564805.7	144835.9	Systematic
10	564833.5	144852.8	Systematic
11	564777.1	144851.5	Systematic
12	564804.9	144868.4	Systematic
13	564832.8	144885.4	Systematic
14	564860.6	144902.3	Systematic
15	564776.3	144884.1	Systematic

Figure D-1. Map of 128-B-3 Verification Sample Locations.

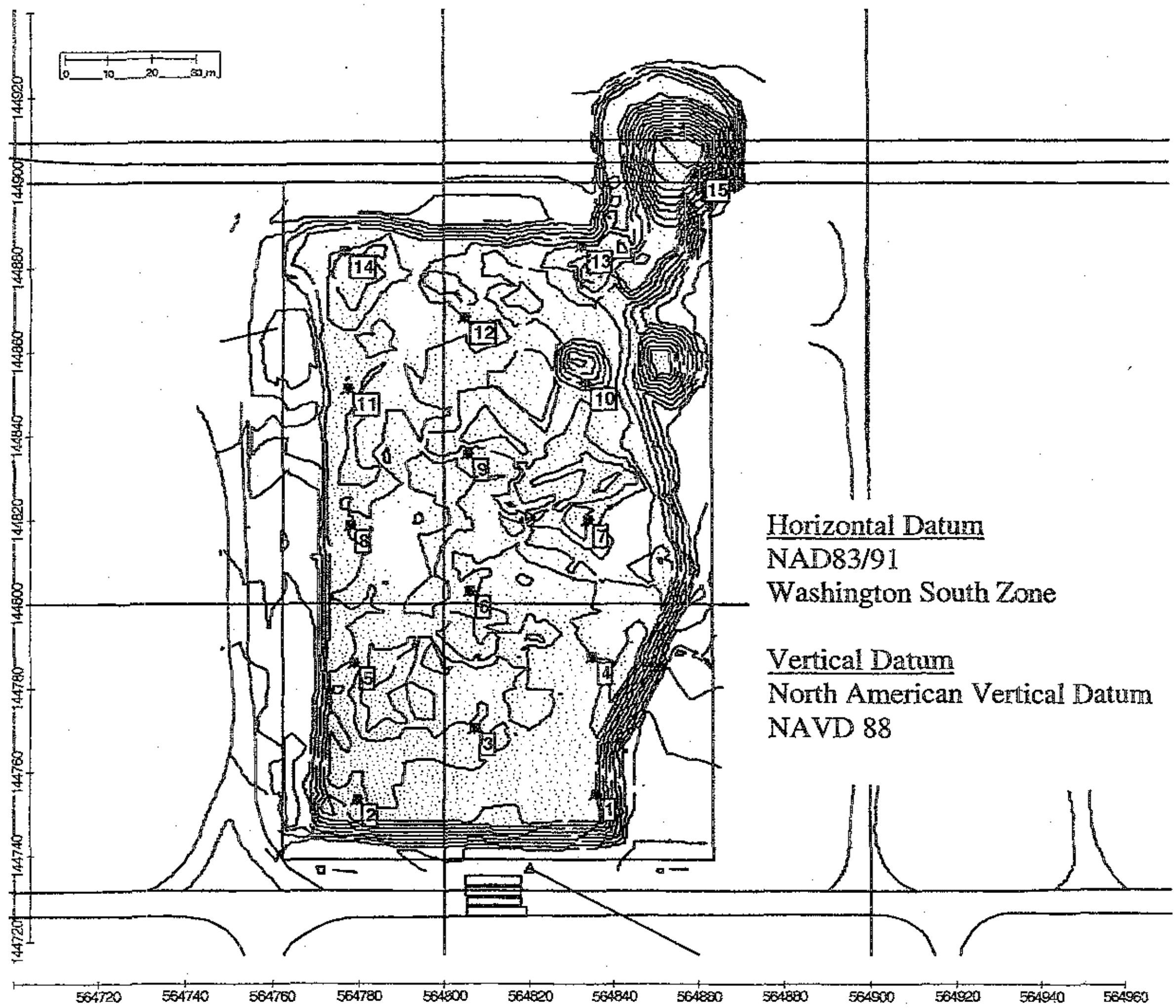
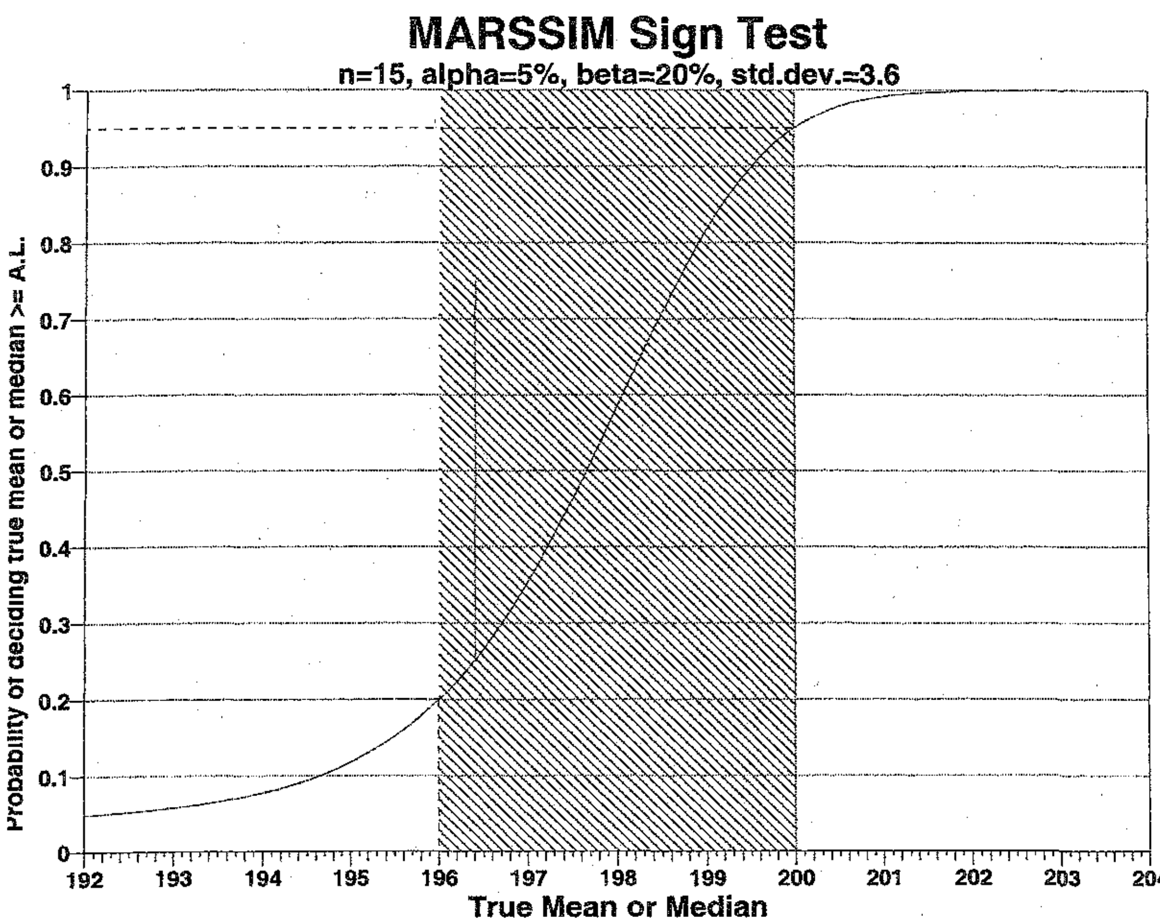


Figure D-2 is a performance goal diagram, described in the U.S. Environmental Protection Agency's (EPA) QA/G-4 guidance (EPA 2000b). It shows the probability of concluding the sample area is dirty on the vertical axis versus a range of possible true median (mean) values for the site on the horizontal axis. This graph contains all of the inputs to the number of samples equation and pictorially represents the calculation.

The solid vertical line to the right of the gray region is shown at the threshold (action limit) on the horizontal axis. The width of the gray shaded area is equal to Δ; the upper horizontal dashed line is positioned at $1-\alpha$ on the vertical axis; the lower horizontal dashed line is positioned at β on the vertical axis. The short vertical line in the gray region to the left of the action level is positioned at one standard deviation below the threshold. The shape of the curve corresponds to the estimates of variability. The calculated number of samples results in the curve that passes through the lower bound of Δ at β and the upper bound of Δ at 1-α. If any of the inputs change, the number of samples that result in the correct curve changes.

Figure D-2. Performance Goal Diagram.



D.5 Statistical Assumptions

The assumptions associated with the formulas for computing the number of samples are as follows:

1. The computed Sign test statistic is normally distributed,
2. The variance estimate, S^2, is reasonable and representative of the population being sampled,
3. The population values are not spatially or temporally correlated, and
4. The sampling locations will be selected probabilistically.

The first three assumptions will be assessed in a post-data collection analysis. The last assumption is valid because the gridded sample locations were selected based on a random start.

D.6 Sensitivity Analysis

The sensitivity of the calculation of number of samples was explored by varying s, LBGR, β and α and examining the resulting changes in the number of samples. The following table shows the results of this analysis.

		Number of Samples					
AL=200		α=5		α=10		α=15	
		s=10	s=5	s=10	s=5	s=10	s=5
LBGR=90	β=15	10	10	8	8	6	6
	β=20	9	9	6	6	5	5
	β=25	8	8	5	5	4	4
LBGR=80	β=15	10	10	8	8	6	6
	β=20	9	9	6	6	5	5
	β=25	8	8	5	5	4	4
LBGR=70	β=15	10	10	8	8	6	6
	β=20	9	9	6	6	5	5
	β=25	8	8	5	5	4	4

s = standard deviation
LBGR = lower bound of gray region (% of action level)
β = beta (%), probability of mistakenly concluding that μ > action level
α = alpha (%), probability of mistakenly concluding that μ < action level
AL = action level (threshold)

D.7 Recommended Data Analysis Activities

Post-data collection activities generally follow those outlined in the EPA's *Guidance for Data Quality Assessment* (EPA 2000a). The data analysts will become familiar with the context of the problem and goals for data collection and assessment. The data will be verified and validated before being subjected to statistical or other analyses. Graphical and analytical tools will be used to verify to the extent possible the assumptions of any statistical analyses that are performed as well as to achieve a general understanding of the data. The data will be assessed to determine whether they are adequate in both quality and quantity to support the primary objective of sampling.

Because the primary objective for sampling for this site is to compare the site mean value with a threshold value, the data will be assessed in this context. Assuming the data are adequate, at least one statistical test will be done to perform a comparison between the data and the threshold of interest. Results of the exploratory and quantitative assessments of the data will be reported, along with conclusions that may be supported by them.

D.8 References

BHI, 2003, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, BHI-01249, Rev. 3, Bechtel Hanford, Inc., Richland, Washington.

DOE-RL, 2005, *Remedial Design Report/Remedial Action Work Plan for the 100 Area,* DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, 1995, *Guidance on Sampling and Data Analysis Methods*, Publication No. 94-49, Washington State Department of Ecology, Olympia, Washington.

EPA, 2000a, *Guidance for Data Quality Assessment*, EPA QA/G-9, EPA/600/R-96/084, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 2000b, *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, EPA/600/R-96/055, U.S. Environmental Protection Agency, Washington, D.C.

EPA, DOD, DOE, and NRC, 2000, *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*, NUREG-1575, Rev. 1, EPA 402-R-97-016, Rev. 1, DOE/EWH-0624, Rev. 1, U.S. Environmental Protection Agency, U.S. Department of Defense, U.S. Department of Energy, and U.S. Nuclear Regulatory Commission, Washington, D.C.

Gilbert R. O., J. R. Davidson, J. E. Wilson, and B. A. Pulsipher, 2001, *Visual Sample Plan (VSP) Models and Code Verification*, PNNL-13450, Pacific Northwest National Laboratory, Richland, Washington.

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 12

Mike Mihalic -Field Remediation Closure Spent Nuclear Fuel (SNF)
and Anomalies for 118-B-1 and 118-C-1 Burial Grounds

FIELD REMEDIATION CLOSURE

SNF AND ANOMALIES

118-B-1 AND 118-C-1 BURIAL GROUNDS

(Status- December 8, 2005)

SNF

- Inventory on hand
  118-B-1:
  2 confirmed whole pieces
  1 confirmed fractional piece
  1 fractional piece (suspect)

  118-C-1:
  4 confirmed fractional pieces
  3 whole pieces (suspect)

  Total weight is ~14.3 lbs

- Current schedule is to ship to KW ~ mid February 2006
- Readiness Assessment (RA) will be held prior to loading and shipping
- FE&C will do the loading, FH to witness, WCH will load the PAS-1 cask onto the trailer and deliver to KW
- The inspection and maintenance requirements for both PAS-1 casks are current
- One cask (empty) being readied to send to FH for their dry run and shipping items from PNNL
- FH preparing a plan for SNF and other items post K Basins

ANOMALIES

- Currently ~800 anomalies in B/C site
- WCH currently has sufficient characterization information to ship some items to ERDF based on like items
- Subcontractor selected for anomalies characterization, identification, packaging determination and shipping method recommendation.
- Current Schedule for Anomalies Subcontractor:
  -Award ~end of December
  -Mobilize ~ end of January
  -Planned completion (anomalies disposition) at B/C is ~mid July 2006

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 13

100K,100F, 1U2/6 100D Status Notes

Bechtel Hanford, Inc.

CALCULATION SHEET

Originator ______ Date ______ Calc. No. ______ Rev. No. ______
Project ______ Job No. ______ Checked ______ Date ______
Subject ______ Sheet No. ______

100 K - Backfill complete 116-KE-4 & effluent P.L.
- Continue Backfill East 1/2 MLT
- W. 1/2 data back - preparing backfill concur -

- 118-K-1 - ORR

100 F - completed Excavation & loadout of All Remaining Sites
- preparing work instruction (SAP) & ~~CR~~ Verification Sampling
- initiated remediation of Burial Grounds

118-F-5
100-F-20
118-F-9
Overburden 118-F-6

IU-2/6 Suspended contract finish design/submittals

100 D initiate procurement process in January
for 100 D Burial Grounds & Remaining sites
TPA Milestone "initiate remediation by 7/31/06".

Donnelly, Jack W

From: Fancher, Jonathan D (Jon)
Sent: Thursday, December 08, 2005 9:34 AM
To: Donnelly, Jack W
Subject: For UMM

100-N Input

Jack

- All excavation is complete
- Subcontractor has demobilized
- Closeout samples have been collected and results are due 12/14/05
- Backfill RFP issued 12/1/05
- Pre-bid meeting 12/7/05
- Backfill award 1st quarter CY 2006

Jon Fancher ☺
100N Field Remediation Closure FRM
☎(509) 373-9556/ (509) 531-0700
page 373-PAGE, 7345
jdfanche@wch-rcc.com

- Backfill expected to start April 2006
- Finish Backfill Sept 2006
- ~~[illegible]~~
- Revegetation to follow during planting window.

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 15

Rudy Guercia- 300 Area D & D Status as of 12/8/05

300 Area D&D Status
December 8, 2005
300 Area Unit Manager Meeting

303-M, 334, 334A, 334 Tank Farm

- Demolition has been performed on all three of the 334 structures. Load out of debris from 334A should be completed within the next week.
- A request to defer the foundations for the 334 structures is being drafted and will be provided to DOE and EPA by the end of the month.
- 303-M demolition is expected to be performed by the end of December.

MO-052/3225

- Both structures were demolished in October 2005. There are no foundations or slabs left associated with these 2 buildings. No further actions are needed for these two structures.

314

- Demolition is expected to be complete by the end of December 2005.
- A request to defer the remaining foundation is being drafted and will be provided to DOE and EPA by the end of the month

3712/3716/3715

- Hazardous material removal will be performed in these buildings during the month of December. A fixative (paint) will be applied, as needed, to the walls and ceiling after hazardous material removal has been completed.
- Facility demolition is expected to begin in late December.
- The 384 Bunker Tank pit will be backfilled prior to performing demolition of the 3715 building. This is being done as a safety precaution due to the close proximity of the building foundation to the open pit.

333, 306-E, and 306-W

- Hazardous material removal will begin in these buildings in January 2006.

324/327

- Draft EE/CA for the 324, 327, and associated buildings to perform D&D under CERCLA was submitted to DOE this week.
- Public comment of the 324 RCRA Closure Plan is scheduled to begin on January 3, 2006.

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

<u>ATTACHMENT 16</u>

Memo on 300 Area Field Remediation Status

300 Area Field Remediation: On Thursday, December 1, the project completed load out of all waste remaining in the staging area and the AOC from 618-3 and 618-8 Burial Grounds. Sampling has begun on the eastern-most 618-2 stockpiles in the staging area. Load out of waste is expected to start Wednesday, December 14.

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 17

Jack Donnelly Email on Use of 618-3 AOC for 618-2 Waste

Black, Sharon P

From: Donnelly, Jack W
Sent: Tuesday, January 03, 2006 12:45 PM
To: Black, Sharon P
Subject: FW: FW: Use of 618-3 AOC for 618-2 waste

Attached is the agreement from EPA on the 618-2/3....this is what I provided in the UMM.

As far as the other, let me look.

-----Original Message-----
From: Boyd.Alicia@epamail.epa.gov [mailto:Boyd.Alicia@epamail.epa.gov]
Sent: Tuesday, November 22, 2005 1:35 PM
To: Smith, Douglas C (Chris)
Cc: boyd.alicia@epamail.epa.gov; jack.donnelly@wch-rcc.com
Subject: Re: FW: Use of 618-3 AOC for 618-2 waste

Chris

Using the 618-3 waste site as a sorting/segregation area for waste from the 618-2 burial ground sounds like it will minimize the possibility of waste dispersion due to wind effects. I concur with the use of this procedure. Please make sure that final closeout sampling of the 618-3 site addresses the contaminants associated with both the 618-3 and 618-2 sites.

Alicia L. Boyd
EPA Hanford Project Office
309 Bradley Blvd Suite 115
Richland, WA 99352
(509) 376-4919

"Smith, Douglas C (Chris)" <Douglas_C_Chris_Smith@rl.gov>	To	Alicia Boyd/R10/USEPA/US@EPA
	cc	
11/03/2005 09:07 AM	Subject	FW: Use of 618-3 AOC for 618-2 waste

Alicia:

See WCH summary below…please advise if you concur with the approach.

Thanks

Chris

From: Donnelly, Jack W
Sent: Thursday, November 03, 2005 8:42 AM
To: Smith, Douglas C (Chris)
Subject: Use of 618-3 AOC for 618-2 waste

Good morning Chris;

The project has been evaluating the potential use of the 618-3 waste site (remediated, but not verified clean and not backfilled) as a waste sorting/segregation area for 618-2 waste material. The primary basis is to help maintain better control and prevent dispersion from the waste by placing in an existing excavation area; especially during the late fall winds which typically occur.

Originally, I was reviewing the waste staging pile requirements in the 300 Area RDR, and verifying this could be performed in accordance with the requirements, and it would be compliant. Secondly, we have verified with our nuclear safety representative and they have spoken with Mark Jackson, DOE. There are no nuclear safety issues, and Mark planned to tour the sites sometime soon.

However, in talking with Jeff Lerch and Frank Corpuz, EPA (Mike Goldstein) had already allowed the 618-2 and 618-3 waste sites (which are adjacent to each other) to be considered a single AOC due to the close proximity of the adjoining waste site. This is also why the existing staging pile area is for the waste from both of those waste sites. This is well within the EPA guidance for AOCs. Therefore, the staging pile requirements would not apply in this situation, so waste can be moved with no additional requirements. Should this occur, the verification sampling requirements will have to address contaminants associated with both waste sites.

The project would like to get Alicia's concurrence on using the 618-3 waste site for 618-2 waste material. The project still may use portions of the 618-2 waste site to stage material. Can you please forward this email to Alicia for concurrence. This will help us in our planning, and would hope she could sent an email by next week if possible.

Thanks. Jack Donnelly

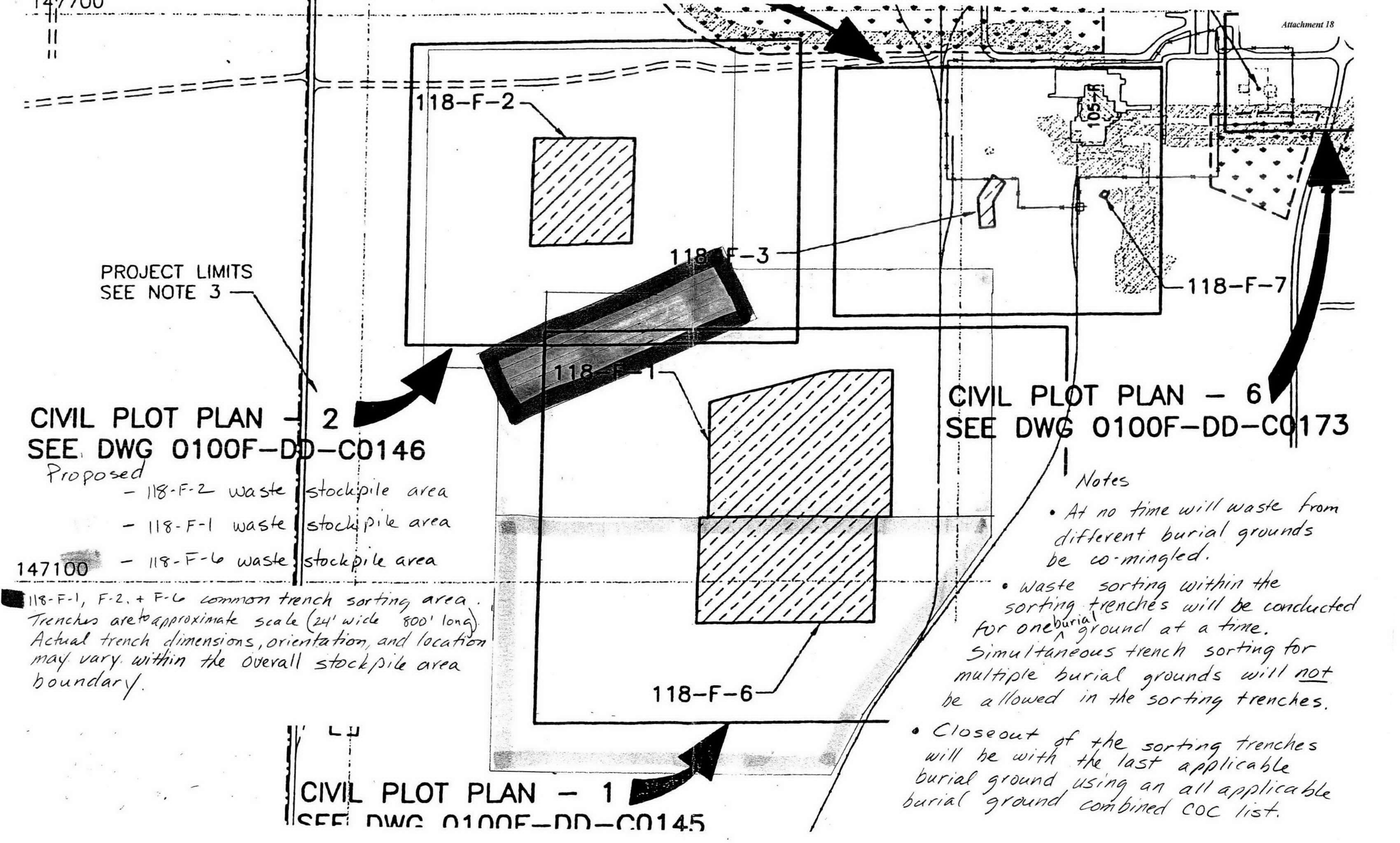
100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 18

Jack Donnelly - Map of Combined Trench Waste Sorting Area
for the 118-F-1,118-F-2 and118-F-6 Waste Sites



Proposed
- 118-F-2 waste stockpile area
- 118-F-1 waste stockpile area
- 118-F-6 waste stockpile area

118-F-1, F-2, + F-6 common trench sorting area. Trenches are to approximate scale (24' wide 800' long). Actual trench dimensions, orientation, and location may vary within the overall stockpile area boundary.

Notes
- At no time will waste from different burial grounds be co-mingled.
- Waste sorting within the sorting trenches will be conducted for one burial ground at a time. Simultaneous trench sorting for multiple burial grounds will <u>not</u> be allowed in the sorting trenches.
- Closeout of the sorting trenches will be with the last applicable burial ground using an all applicable burial ground combined COC list.

100 AREA / 300 AREA UNIT MANAGERS' MEETING

Groundwater / Remedial Action Unit / Source Operable Units

December 8, 2005

ATTACHMENT 19

DOE Radioactive Air Emissions from the Hanford Site

Department of Energy
Richland Operations Office

Radioactive Air Emissions from the Hanford Site

December 8, 2005

Dose Estimates for EPA and State Regulations – Two Types

- Annual Radionuclide Air Emissions Report estimates dose from **actual** emissions

- CERCLA Air Monitoring Plans estimate dose from **potential** emissions (PTE) based on inventory

Radionuclide Emissions

<u>Annual Reporting</u>

- Retrospective using actual and estimated emissions for year
- All onsite sources
- Actual measured stack emissions
- Estimated actual emissions from non-point (diffuse and fugitive) sources based on ambient air monitoring at the Site perimeter

<u>CERCLA Air Monitoring Plan</u>

- Prospective using maximum annual "potential to emit" (PTE)
- Single source or area
- Estimated PTE for sources based on maximum inventory

Receptor Locations

Annual Reporting

- MEI receives highest combined dose from all onsite sources
- Based on atmospheric dispersion for reporting period
- Determined each year based on site emissions and wind data, using CAP88-PC

CERCLA Air Monitoring Plan

- Public receptor who would receive highest dose due to emissions from a single source or area
- Based on long-term atmospheric dispersion
- Determined for each specific source or activity, using CAP88-PC

Radioactive Air Emissions Report

- Reports **all** radioactive air emissions and the offsite dose to a member of the public
  - Stacks reported in accordance with Subpart H
  - Diffuse sources reported in accordance with the MOU between EPA-HQ and DOE-HQ, May 16, 1995

- Monitoring data for stacks and ambient air are reported along with their dose contributions
  - Stacks and point sources: Sections 2 and 3
  - Diffuse and fugitive sources: Section 4
  - Air monitoring results: Section 5

Dose Assessment of Diffuse and Fugitive Emissions at Hanford

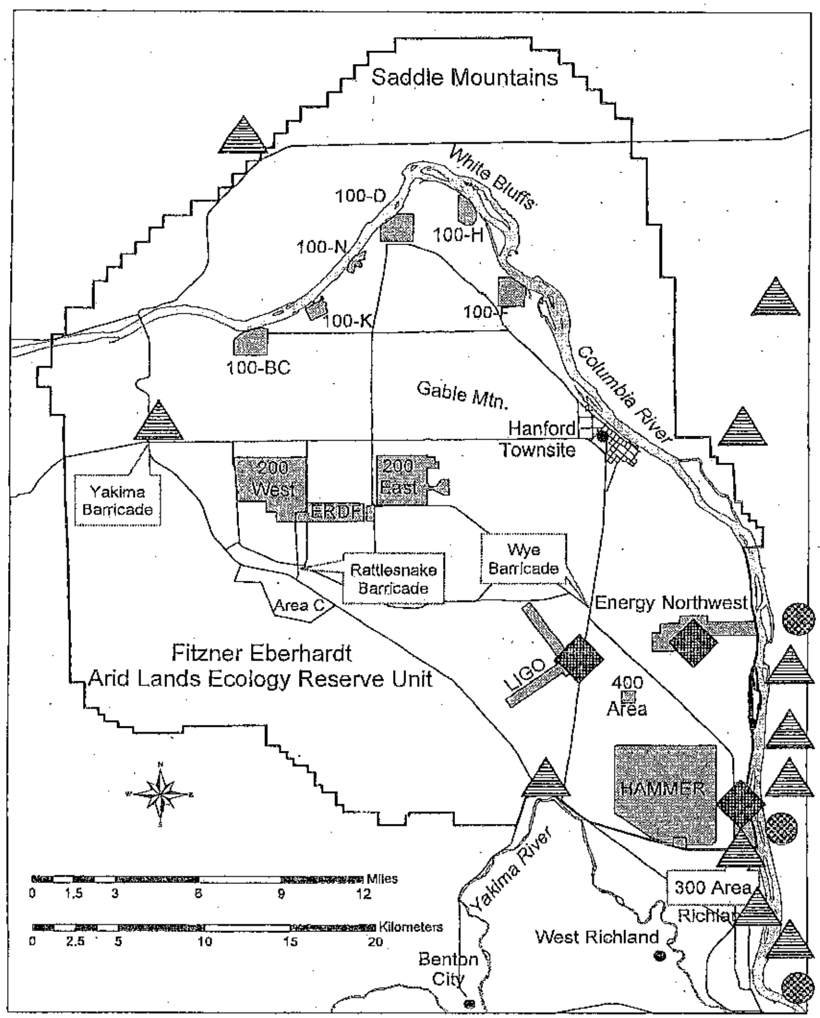
- Emission estimates are based on ambient air concentrations measured downwind at the site perimeter; i.e., possible MEI locations

- Contributions from stack emissions and upwind background radioactivity are subtracted

- Net difference attributed to diffuse and fugitive sources

- Dose to MEI from estimated diffuse and fugitive source emissions calculated using CAP88-PC

MEI Screening Locations
for Annual Air Emissions Report

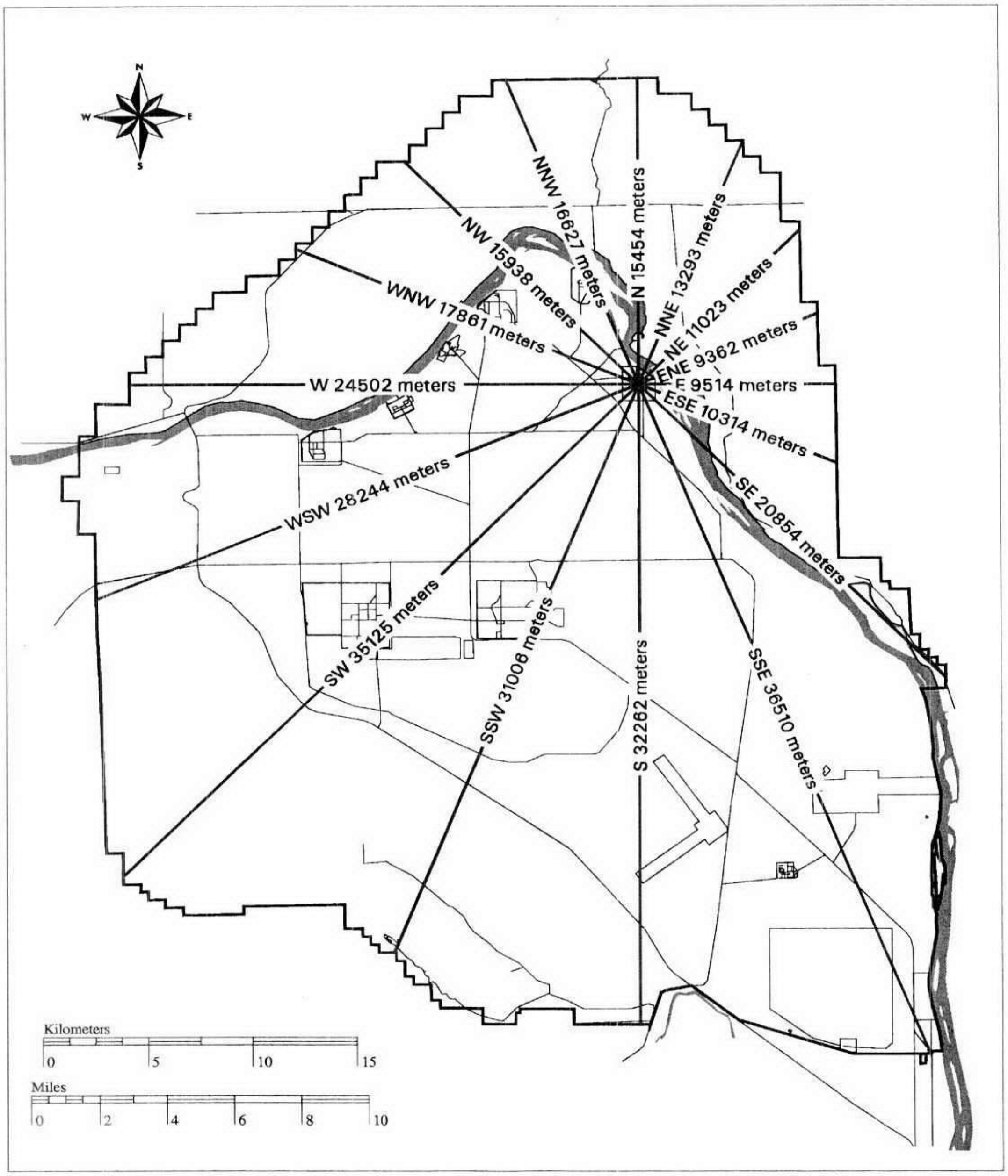


- Air Monitoring Stations
- Onsite Non-DOE Facilities
- Past Offsite Receptors
  - < Ringold
  - < Sagemoor
  - < Riverview

Example of WCH dose modeling of the PTE from F Area

Attachment:	B	
Originator:	T. M Blakley	Date:
Checked:	J. D Ludowise	Date:
Calc. No.:	0100F-CA-V0238	
Rev. No.:	0	Sheet No.: 1 of 2

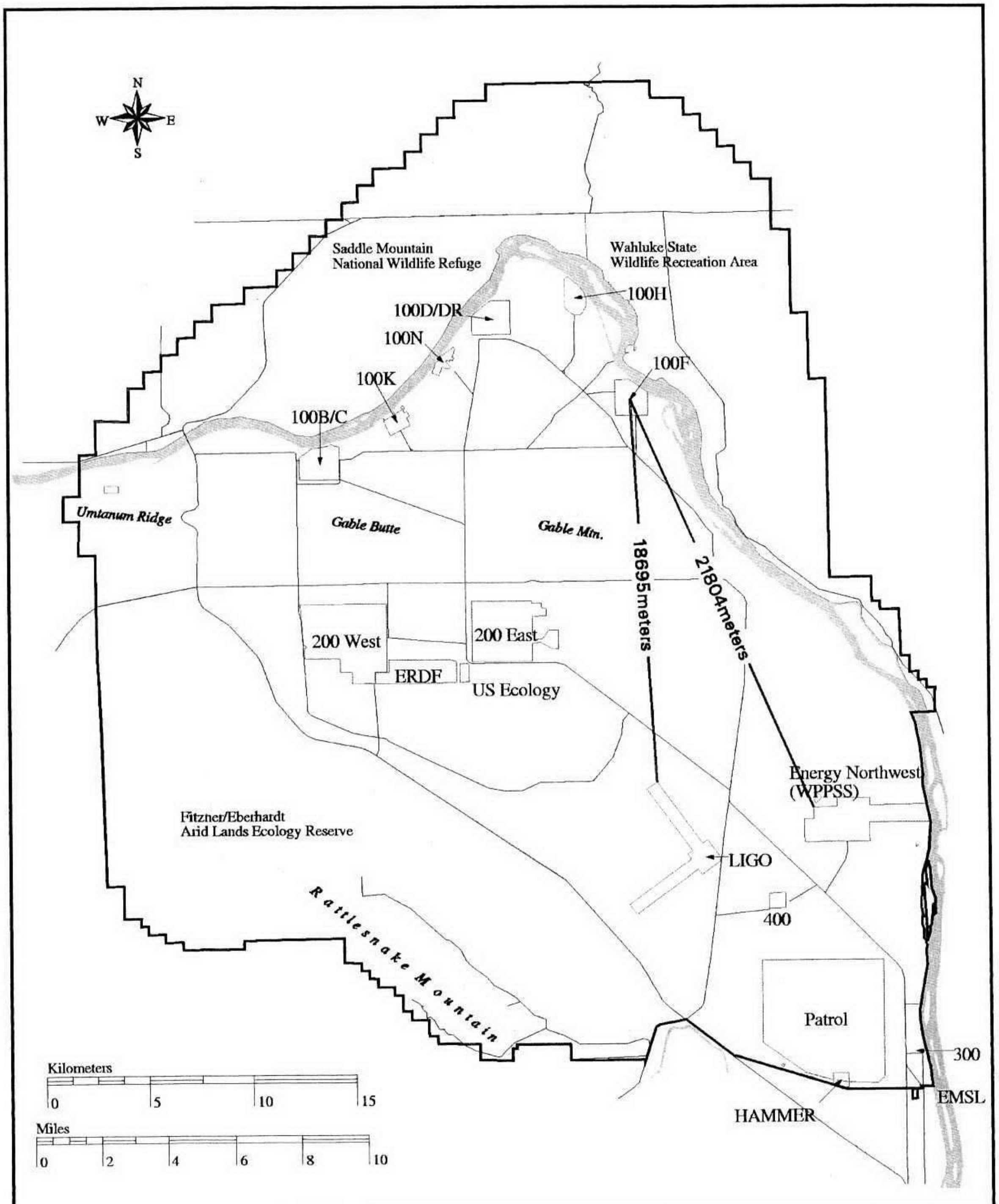
Distances from 105F Reactor to Hanford Site Boundary



ERC:dlhf rodovsti/044dist105f/ap-site.aml 04/21/00 Database: 12-JAN-2001 1:14 PM

Attachment:	B	
Originator:	T. M Blakley	Date:
Checked:	J. D Ludowise	Date:
Calc. No.:	0100F-CA-V0238	
Rev. No.:	0	Sheet No.: 2 of 2

Distances from 100-F to LIGO and Energy Northwest



ERC:maa:12/02/03:/home/maaye/amls/dist-roses/100f-ligo-enw:Rev. 0 Database: 08/02/04 12:17 PM